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SHARP NOSE LENS DESIGN USING REFRACTIVE INDEX GRADIENT

ODED AMICHAI

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Monterey, California 93940

NAVAL POSTGRADUATE SCHOOL
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The work reported herein was carried out for the Naval Postgraduate School by Dr. Oded Amichai under Contract Number N00228-81-C-H231. The work presented in this report is in support of the DARPA/AIFS project. The work is a continuation of earlier research efforts by several thesis students. An age-old problem is the conflict between optical quality and aerodynamic performance for infrared domes. The research may provide a means to circumvent the problem through use of gradient refractive index. The project on Navy Applications of AIFS is funded by Defense Advanced Research Projects Agency and is under the cognizance of Professor A. E. Fuhs.

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For infrared sensors located at the nose of a missile or a projectile, an age-old problem occurs. A conflict between optical quality and aerodynamic drag exists. A new approach for solving this problem is being developed using gradient refractive index, GRIN, for lens design. The equations for lens design incorporating GRIN are formulated for the special case of spherically symmetrical GRIN. A computer code for

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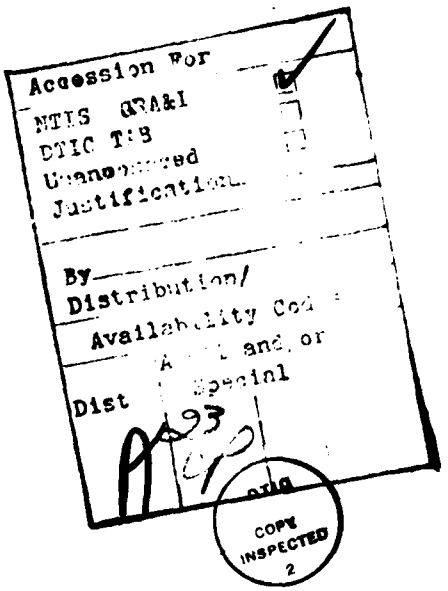
Features of the computer program include the following: use of many subroutines for clarity and for easy modification, and use of program structure for easy integration into an optimization code.

Sample lens designs and lens performance are presented. The computer code provides the tools for lens design. Considerable additional work is needed for selecting the best lens design.



ABSTRACT

For infrared sensors located at the nose of a missile or a projectile, an age-old problem occurs. A conflict between optical quality and aerodynamic drag exists. A new approach for solving this problem is being developed using gradient refractive index, GRIN, for lens design. The equations for lens design incorporating GRIN are formulated for the special case of spherically symmetrical GRIN. A computer code for designing a GRIN lens and for determining aberrations has been developed. A different program (LENS) calculates lens design and lens performance for the case of homogeneous refractive index. Results of this program provide a check on the more complex program which includes GRIN. The computed program calculates the spot diagram for both meridianal and skew rays. The spot diagram, which is the intersection of rays with the focal plane, is plotted, and the σ_{rms} and centroid location of the spot diagram are calculated. Also a cumulative energy diagram is obtained from the program. The computer code has been organized to calculate the items enumerated above for either a circular cone for the inside or outside surface of the pointed lens. For homogeneous refractive index, both cases are included in the program discussed in this report. However, for the GRIN case, only the complete program for a lens with a conical surface on the outside is reported here. The alternate case is being developed by a thesis student.

Features of the computer program include the following: use of many subroutines for clarity and for easy modification, and use of program structure for easy integration into an optimization code.

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1. INTRODUCTION

A long-term conflict exists between optics and aerodynamics for missile nose design. Optics requires a blunt shaped nose similar to that used on the Sidewinder missile. Favorable aerodynamics for supersonic missiles requires a sharp nose which permits an attached shock wave. For rocket powered missiles or projectiles, the sensor and associated optics occupies the complete nose area. The penalty of a blunt nose is high drag. For ramjet propelled missiles or projectiles, the penalty of a blunt nose is poor pressure recovery by the inlet; this statement assumes a nose inlet is used.

In times past, the lens designer had available three design parameters; a satisfactory lens in the general shape of a cone has not been designed. A lens can be designed using homogeneous refractive index which focuses rays; however, off-axis rays have very large aberrations. The thesis by Terrell [1] discusses the design of a conical lens.

A fourth design parameter has become available which is spatially variable refractive index. The associated technology is known as GRIN; see references [2-13]. GRIN is short notation for Gradient Refractive Index. The thesis by Frazier [14] briefly introduced the use of GRIN in lens design; likewise the thesis of Terrell [1] has a brief discussion. The thesis of Carr [15] will have more extensive results.

The development of materials which have variable refractive index has been motivated by optical fiber technology. Optical fibers can propagate a single mode with low losses if an ap-

propriate spatial variation of refractive index exists. Based on the information in reference [2] , the maximum variation of GRIN is limited to a few percent. The report contains twelve sections. In section 3 the problem of the homogeneous case is solved (program LENS) while the GRIN lens design is formulated in section 4 (program GRIN). The flow charts to the computer programs are given in section 5 and 6, and a user's guide to each of the programs is illustrated in section 7. The programs are listed in sections 9 and 10.

2. BRIEF OVERVIEW OF PROBLEM FORMULATION

Define the axial distance as x and radial distance as r in a cylindrical coordinate system. The lens is to be axisymmetric so that angle is not a variable.

In general the shape of the front surface, is a function of r

$$x = F_f(r) \tag{2.1}$$

where subscript f denotes front surface. Likewise the rear surface is a function of r

$$x = F_r(r) \tag{2.2}$$

where subscript r indicates the rear surface.

As a simplification, either the front or rear surface is a circular cone. Terrell [1] treated the case of a conical front surface; Carr [15] is investigating the case of a conical rear surface. This report develops a computer code which calculates either case. A single consistent computer program is used for both cases; this fact is important for application

of optimization codes.

In general, the GRIN can be specified as

$$n = F(x,r) \tag{2.3}$$

The function F involves both spatial variables. However, a less complex GRIN is used which is spherically symmetrical refractive index. In this case

$$n = n(x_c,r') \tag{2.4}$$

where r' is radial distance from the center of symmetry for the sphere. The location of the center of the spherical GRIN is on the lens axis at axial position x_c.

One very important computational advantage of spherical GRIN is that the rays within the lens are confined to a single plane. In the case of skew rays, the plane of the rays is not a meridianal plane of the lens.

The equation for a ray trajectory in a spherically symmetric GRIN geometry is

$$\theta_e = \theta_0 + E\int \frac{dr'}{r'\sqrt{r'^2n^2(r')-E^2}} \tag{2.5}$$

where E is a constant for a ray. The value of E is obtained from

$$E = \epsilon n_0(r_0')r_0'\sin\Psi_0 \tag{2.6}$$

Define $\vec{r}'$ as a unit vector in the direction of a line extending from x_c to point P in Figure 1. Define $\vec{R}$ as a unit vector of a ray which has been refracted by the surface at point P. The angle Ψ_0 is obtained from

$$\cos \Psi_0 = \vec{r}_0' \cdot \vec{R} \qquad (2.7)$$

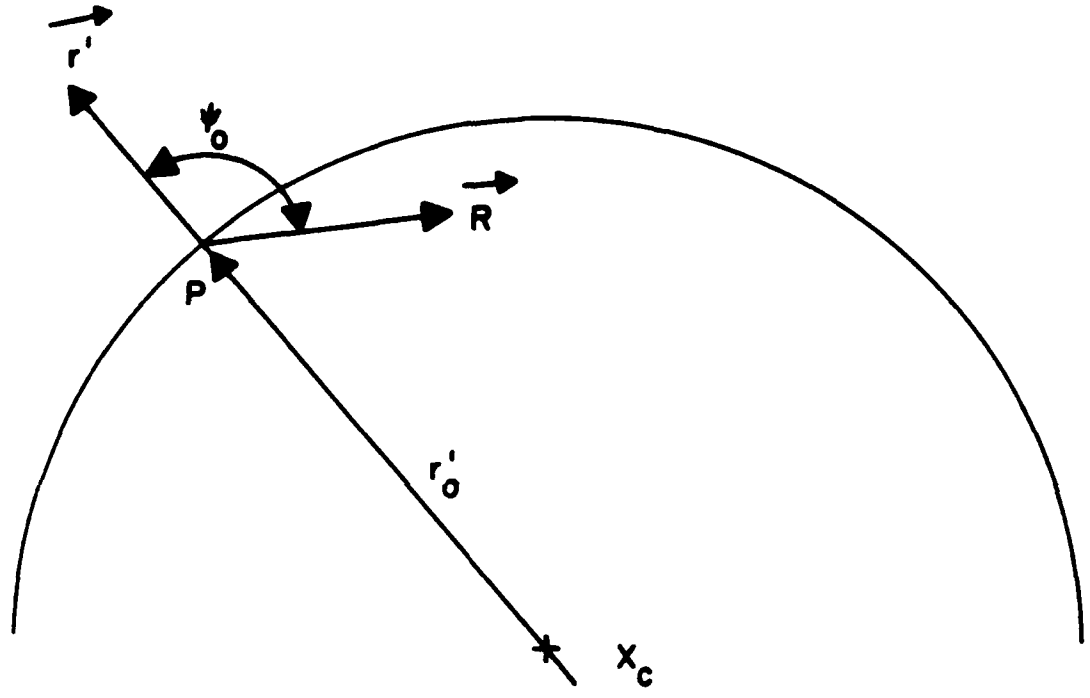


Figure 1. Geometry for Ray Tracing in a Spherically Symmetrical GRIN medium. The ray vector, $\vec{R}$, and the radius vector, $\vec{r}'$, are illustrated.

In equation (2.6), the ε is a sign function having a value of + 1.0 or - 1.0 depending on the value of Ψ within the lens.

$$\varepsilon = \begin{cases} +1.0 & \Psi \leq \pi/2 \\ -1.0 & \Psi > \pi/2 \end{cases} \tag{2.8}$$

Equation (2.5) can be integrated for certain functions n(r'). One function is

$$n(r') = \left[A + B(r'/r_0)^2 \right]^{\frac{1}{2}} \tag{2.9}$$

where A and B are constants. r_0 is a value associated with a specific lens design; a convenient value for r_0 is that value for the ray defining the lens aperture.

Combining equations (2.5) and (2.9) and completing the integration yields

$$\theta_e(r') = -\tfrac{1}{2}\left[\sin^{-1}\left\{ \frac{2E^2/r_r'^2 - A}{(A^2+4BE^2/r_0^2)^{\frac{1}{2}}} \right\} - \sin^{-1}\left\{ \frac{2E^2/r_f'^2 - A}{(A^2+4BE^2/r_0^2)^{\frac{1}{2}}} \right\} \right] \tag{2.10}$$

Equation (2.10) is an explicit relation for θ_e as a function of r'. r_r, r_f are the radii to the rear surface and to the front surface respectively. An explicit relation for r' as a function of θ_e can be derived; the result is

$$r'_{(r,f)}(\theta_e) = \frac{\sqrt{2}\,|E|}{\left(A + \sqrt{A^2+4BE^2/r_0^2} \cdot \sin\left\{ \mp 2\theta_e + \sin^{-1}\left[\frac{2E^2/r_{(r,f)} - A}{\sqrt{A^2+4BE^2/r_0^2}} \right] \right\} \right)^{\frac{1}{2}}} \tag{2.11}$$

For details look at section 4.1. For certain phases of the calculation equation (2.11) is needed.

Thinking ahead to numerical optimization, the function of equation (2.9) was chosen to avoid numerical integration of equation (2.5). Equation (2.5) must be evaluated several times for each ray. A lens design may involve 100 to 1000 rays. Numerical optimization of the lens requires calculation of many different lens shapes. Hence, evaluation of equation (2.5) may occur several thousand times in the process of lens optimization. The GRIN-related parameters to be determined in optimization are A, B and x_c.

3. EQUATIONS FOR THE HOMOGENEOUS CASE

3.1 Meridian Plane

The homogeneous case is included here for several reasons. First, the homogeneous case is a simple example in which the intricacies of lens design are apparent in considerable clarity. Iteration is not required for design of a lens with a homogeneous refractive index, whereas for GRIN, iteration is necessary. Second, the homogeneous case provides a meaningful check of the GRIN program. To conduct the check, the value of B is zero in equation (2.9). Obviously the answers from GRIN program with B equal to zero must agree with answers from the homogeneous case.

The book by Kingslake [16] has been helpful in the program development.

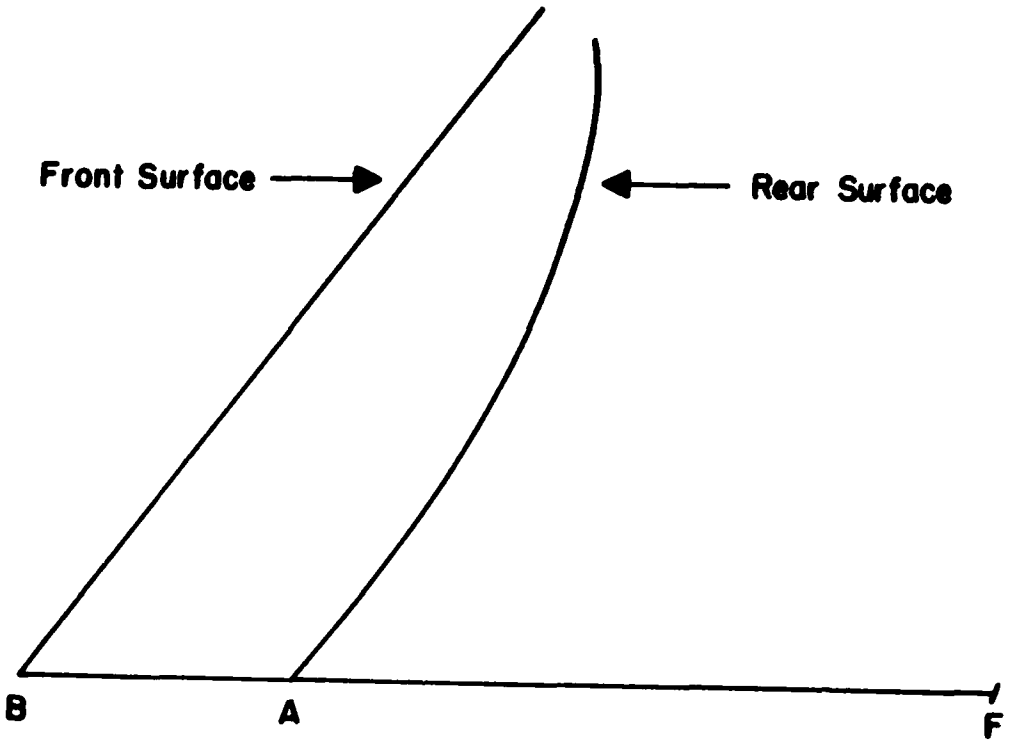


Figure 2. Diagram illustrating the shape of the front and rear surfaces of a GRIN lens. BAF is axis of symmetry. F is the focal point.

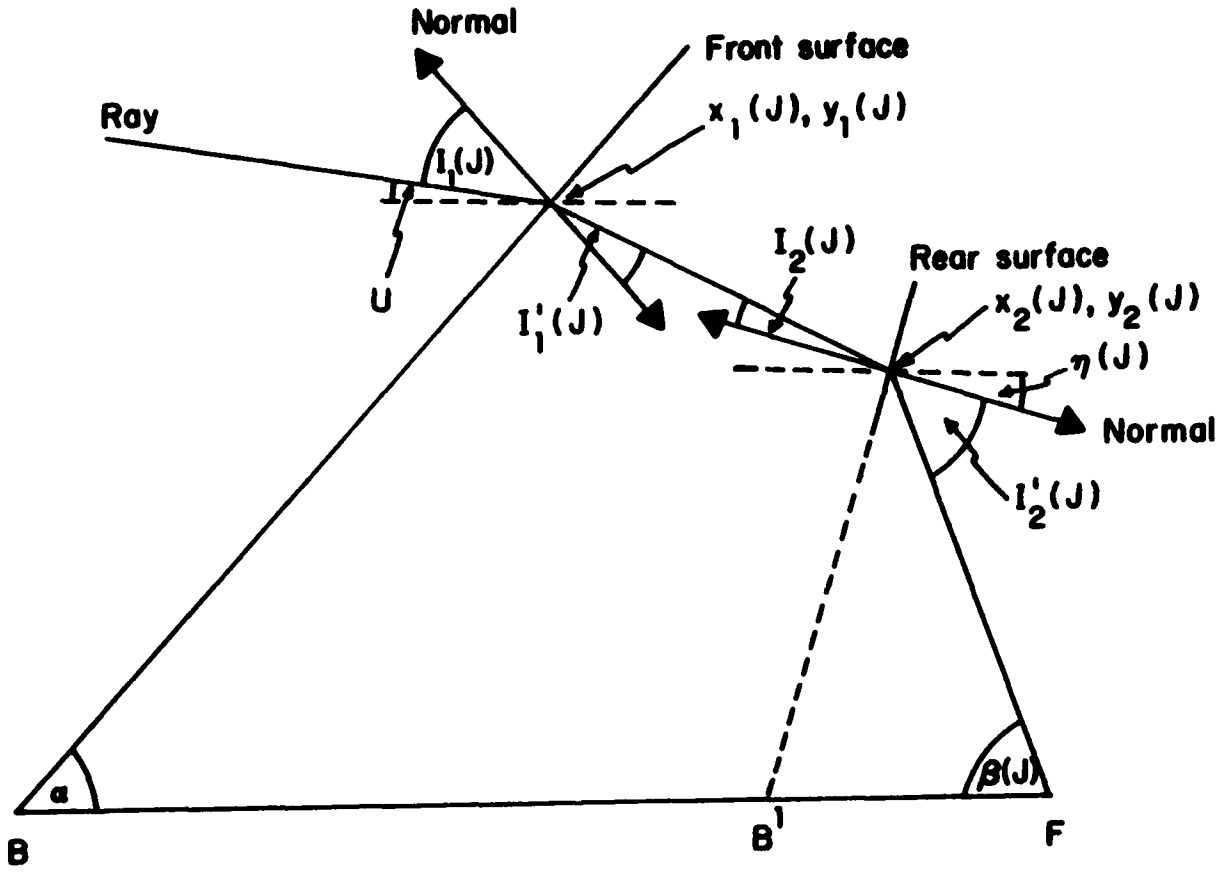


Figure 3. Geometry and angle definitions for the homogeneous refractive index case.

3.1.1 The Equations

Refer to Figure 3 for definition of the symbols.

$$\eta(J) + I_2'(J) = \beta(I) \tag{3.1}$$

$$\sin(I_2[J]) = n_{32} \cdot \sin(I_2'[J]) \tag{3.2}$$

The notation n_{32} is used for the ratio n_3/n_2.

$$I_1'(J) = (\pi/2-\alpha) - (\eta(J) + I_1(J)) \tag{3.3}$$

$$\sin(I_1[J]) = n_{21} \cdot \sin(I_1'[J]) \tag{3.4}$$

$$\alpha + I_1(J) + U = \pi/2 \tag{3.5}$$

3.1.2 Solution

The angles α, $\beta(J)$ are inputs and are known.

From eq. (3.5):

$$I_1(J) = \pi/2 - \alpha - U \tag{3.5.1}$$

From eq. (3.4):

$$I_1'(J) = \sin^{-1}[n_{12} \cdot \sin(I_1[J])] \tag{3.4.1}$$

Substitute eq. (3.5) to eq. (3.3):

$$\eta(J) + I_2(J) = I_1(J) - I_1'(J) + U \tag{3.3.1}$$

But from eq. (3.2):

$$I_2'(J) = \sin^{-1}[n_{32} \cdot \sin(I_2[J])] \tag{3.2.1}$$

From eq. (3.3.1):

$$I_2(J) = [I_1(J) - I_1'(J)] - \eta(J) - U \tag{3.3.2}$$

Substitute eq. (3.3.2) into eq. (3.2.1):

$$I_2'(J) = \sin^{-1}[n_{23} \cdot \sin\{I_1(J) - I_1'(J) - \eta(J) + U\}] \tag{3.2.2}$$

Substitute eq. (3.2.2) into eq. (3.1):

$$\eta(J) + \sin^{-1}[n_{23} \cdot \sin\{I_1(J) - I_1'(J) - \eta(J) + U\}] = \beta(J) \tag{3.1.1}$$

Equation (3.1.1) is solved for $\eta(J)$:

$$n_{23} \cdot \sin(I_1(J) - I_1'(J) - \eta(J) + U) = \sin[\beta(J) - \eta(J)] \tag{3.1.2}$$

Use the formula:

$$\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$$

And substitute:

$$x = \sin(\eta(J)) \; ; \; \sqrt{1 - x^2} = \cos(\eta(J))$$

Equation (3.1.2) will turn into the form:

$$x = \sqrt{\frac{1}{1 + A^2}} \tag{3.1.3}$$

Where:

$$A = \frac{n_{23} \cdot \cos[I_1(J) - I_1'(J) + U] - \cos[\beta(J)]}{n_{23} \cdot \sin[I_1(J) - I_1'(J) + U] - \sin[\beta(J)]} \tag{3.1.4}$$

Therefore:

$$\eta(J) = \sin^{-1}[x] \tag{3.1.5}$$

Knowing $\eta(J)$, $I_2'(J)$ can be solved from equation (3.1), and then, $I_2(J)$ can be solved from equation (3.2).

3.1.3 Coordinates of the Front and of the Rear Surfaces

3.1.3.1 The First Ray

All the magnitudes will be normalized with respect to the radius R. R is the aperture for the lens. Therefore:

$$R = 1.0 \begin{cases} y_1(1) = R \\ x_1(1) = \dfrac{R}{\tan(\alpha)} \end{cases} \tag{3.6}$$

The thickness of the lens is defined:

$$T(1) = \sqrt{[x_2(1) - x_1(1)]^2 + [y_1(1) - y_2(1)]^2} \qquad (3.7)$$

Therefore, the appropriate coordinates of the rear surface are:

$$\begin{cases} x_2(1) = x_1(1) + T(1) \cdot \cos[\pi/2 - \alpha - I_1'(1)] \\ y_2(1) = y_1(1) - T(1) \cdot \sin[\pi/2 - \alpha - I_1'(1)] \end{cases} \qquad (3.8)$$

3.1.3.2 <u>The Other Rays: Coordinates of the Rear Surface</u>

The new point of the rear surface $x_2(J), y_2(J)$ will be the intersection between the surface and the ray.

(a) The equation of the surface:

$$y_2(J) = m[x_2(J) - BB'] \qquad (3.9)$$

$$m = \tan[\pi/2 - \eta(J - 1)] = \cot[\eta(J - 1)] \qquad (3.9.1)$$

$$BB' = BF - B'F$$

$$B'F = y_2(J - 1) \cdot [\cot[\pi/2 - \eta(J - 1)] + \cot[\beta(J - 1)]]$$

$$\therefore B'F = y_2(J - 1) \cdot \{\tan[\eta(J - 1)] + \cot[\beta(J - 1)]\} \qquad (3.9.2)$$

$$\therefore y_2(J) = \cot[\eta(J - 1)]\{x_2(J) - [BF - B'F]\} \qquad (3.9.3)$$

(b) The equation of the ray:

$$y_2(J) = -\tan[\beta(J)]x_2(J) + BF \cdot \tan[\beta(J)] \qquad (3.10)$$

$$\therefore y_2(J) = \tan[\beta(J)] \cdot \{-x_2(J) + BF\} \qquad (3.10.1)$$

From equations (3.9.3) and (3.10.1), the coordinates of the next point at the rear surface are found; those are:

$$\begin{cases} x_2(J) = \dfrac{BF\{\tan[\beta(J)] + \cot[\eta(J - 1)]\} - \cot[\eta(J-1)] \cdot B'F}{\cot[\eta(J - 1)] + \tan[\beta(J)]} \\ y_2(J) = \tan[\beta(J)]\{-x_2(J) + BF\} \end{cases} \qquad (3.11)$$

3.1.3.3 Coordinates of the Front Surface

(a) Equation of the rear surface:

$$y_1(J) = (\tan\alpha) \cdot x_1(J) \tag{3.12}$$

(b) Equation of the ray:

$$y_1(J) = m[x_1(J) - x_2(J)] + y_2(J) \tag{3.13}$$

where:
$$m = -\tan[\pi/2 - \alpha - I_1'(J)] \tag{3.13.1}$$

or:
$$m = -\cot[\alpha + I_1'(J)] \tag{3.13.2}$$

From equations (3.12) and (3.13) the intercept point is calculated:

$$x_1(J) = \frac{y_2(J) + x_2(J) \cdot \cot[\alpha + I_1'(J)]}{\tan\alpha + \cot[\alpha + I_1'(J)]}$$

$$y_1(J) = (\tan\alpha) \cdot x_1(J) \tag{3.14}$$

3.1.3.4 The Thickness at the New Point

$$T(J) = \sqrt{[x_2(J) - x_1(J)]^2 + [y_1(J) - y_2(J)]^2} \tag{3.15}$$

3.2 Skew Rays in the Homogeneous Case

3.2.1 Coordinate Transformation

The x,y coordinates will be shifted by the angle α_p.

$$x' = x \cdot \cos(\alpha_p) - y \cdot \sin(\alpha_p) \tag{3.16.1}$$

$$y' = x \cdot \sin(\alpha_p) + y \cdot \cos(\alpha_p) \tag{3.16.2}$$

$$z' = z \tag{3.16.3}$$

3.2.2 Calculate the Intercept Point of the Front Surface

Assuming that the (0,0) point is at point A

(Refer to figure 2.), the following equations can be derived:

(a) Ray: $R_{ray}^2 = y^2 + z^2$ (3.17.1)

$$\therefore R_{ray} = \left[\frac{y_0'}{\cos(\alpha_p)} - (x + AB) \cdot \tan(\alpha_p)\right]^2 + z_0'^2 \quad (3.17.2)$$

Where R_{ray} is the radius of the ray and the values for y_0', z_0' are known.

(b) Cone: $R_{cone} = \tan(\alpha) \cdot [x + AB]$ (3.18)

Solving equations (3.17.2), (3.18) for x results:

$$XO = -\frac{CDS}{A_2D_2} + \frac{\sqrt{CDS^2 + A_2D_2 \cdot CZD}}{A_2D_2} \quad (3.19.1)$$

$$YO = \frac{y_0'}{\cos(\alpha_p)} - XO \cdot \tan(\alpha_p) \quad (3.19.2)$$

$$ZO = z_0' \quad (3.19.3)$$

Where:

$$A_2D_2 = (\tan\alpha)^2 - (\tan\alpha_p)^2 \quad (3.20.1)$$

$$CDS = \frac{y_0'}{\cos\alpha_p}\tan\alpha_p + (AB)[A_2D_2] \quad (3.20.2)$$

$$CZD = \left(\frac{y_0'}{\cos\alpha_p}\right)^2 + z_0'^2 - (AB)^2[A_2D_2]^2 - 2(AB)\frac{y_0'}{\cos\alpha_p}\tan\alpha_p \quad (3.20.3)$$

3.2.3 Direction Cosines of the Normal

$$f = y^2 + z^2 - (\tan\alpha)^2(x + AB)^2 = 0 \quad (3.21)$$

$$\frac{\delta f}{\delta x} = -2(\tan\alpha)^2(x + AB) \quad (3.21.1)$$

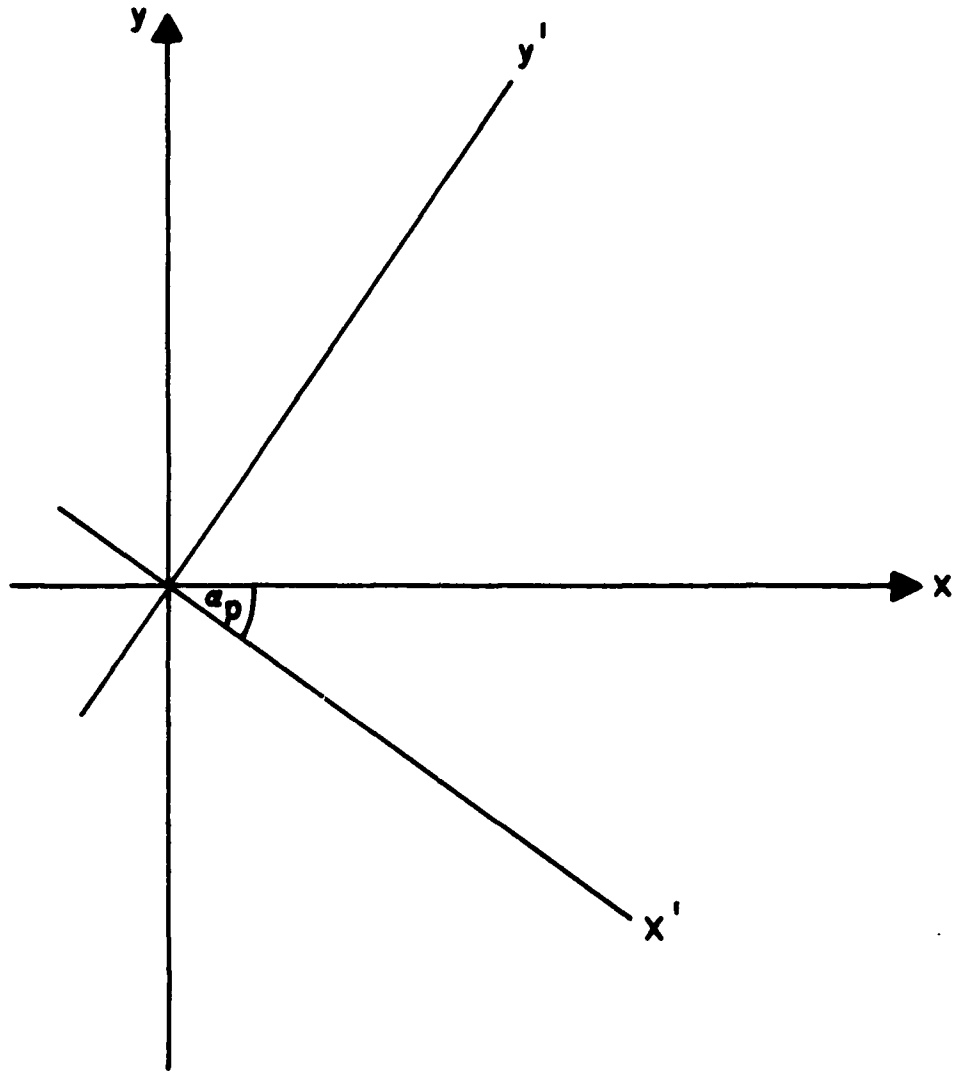


Figure 4. Diagram showing coordinate transformation for off-axis rays.

$$\frac{\delta f}{\delta y} = 2y \; ; \; \frac{\delta f}{\delta z} = 2z \tag{3.21.2}$$

$$|\overrightarrow{\Delta f}| = 2[(\tan\alpha)^4 (x + AB)^2 + y^2 + z^2]^{\frac{1}{2}} \tag{3.21.4}$$

Substituting equation (3.21) can turn equation (3.21.4) into the form:

$$|\overrightarrow{\Delta f}| = \frac{2\tan\alpha}{\cos\alpha} (x + AB) \tag{3.21.5}$$

The direction cosines of the normal are therefore:

$$n_X = \frac{(\delta f/\delta x)}{|\overrightarrow{\Delta f}|} = -\sin\alpha \tag{3.22}$$

$$n_Y = \frac{(\delta f/\delta y)}{|\overrightarrow{\Delta f}|} = \frac{2y}{2\tan\alpha/\cos\alpha\,(x + AB)} \tag{3.23}$$

Define: $\sigma = \tan^{-1}(z/y)$ (3.23.1)

$$y^2 + z^2 = (\tan\alpha)^2 (x + AB)^2$$

$$y^2 (1 + \tan^2\sigma) = \tan^2\alpha (x + AB)^2$$

$$y = (\cos\sigma)(\tan\alpha)(x + AB) \tag{3.23.2}$$

Therefore:

$$n_Y = (\cos\sigma)(\cos\alpha) \tag{3.23.3}$$

Similiarly:

$$n_Z = \frac{(\delta f/\delta z)}{|\overrightarrow{\Delta f}|} = (\sin\sigma)(\cos\alpha) \tag{3.24}$$

3.2.4 Refraction at the Front Surface

The skew ray $\vec{R}$ will be defined:

$$\vec{R} = R_X \cdot (\hat{e}_X) + R_Y \cdot (\hat{e}_Y) + R_Z \cdot (\hat{e}_Z) \tag{3.25}$$

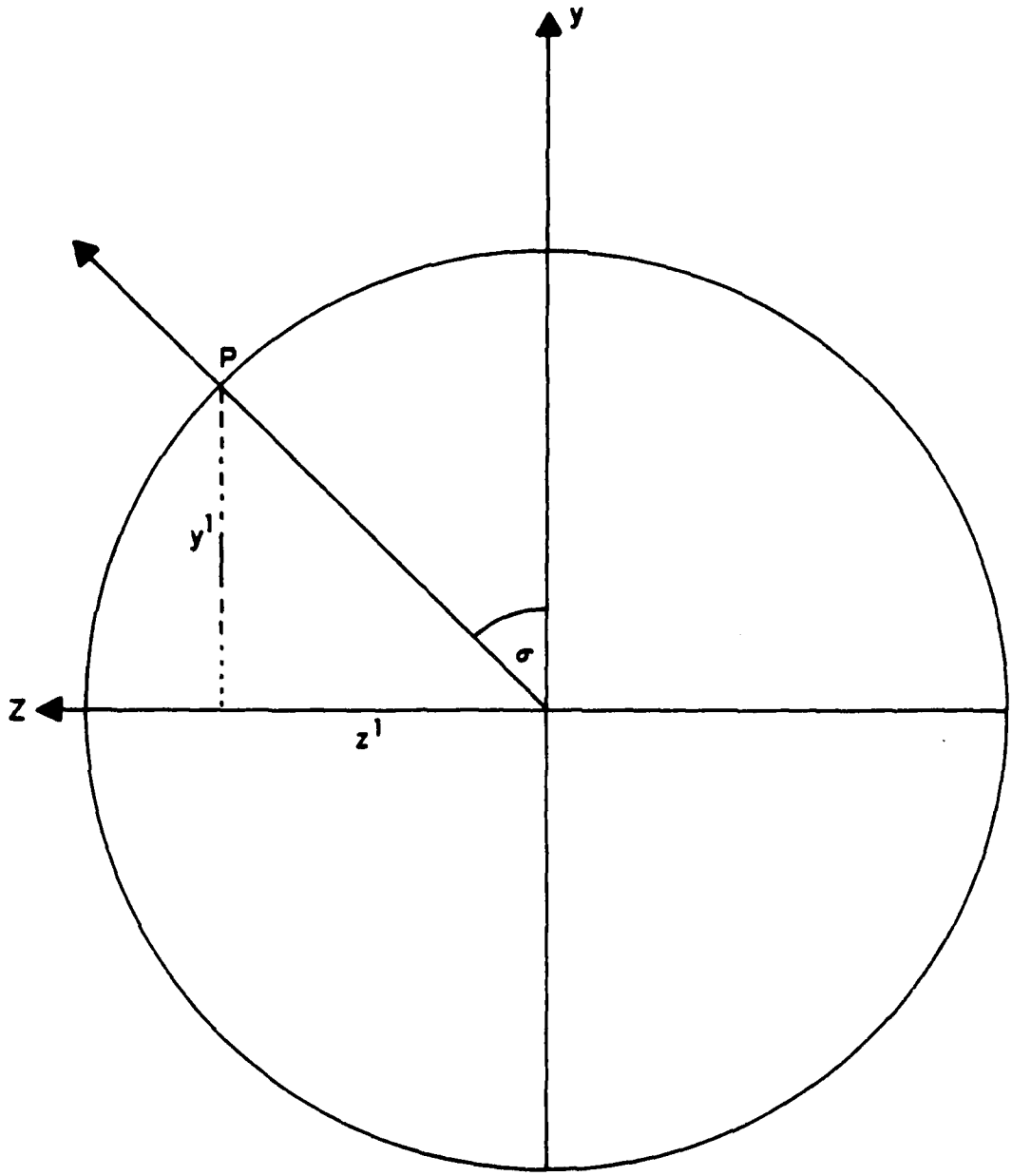


Figure 5. Cross section of lens in a plane normal to the lens axis. Point P is the point where an off-axis ray intersects the front surface of the lens.

Where R_X, R_Y, R_Z are the direction cosines of the ray, and they have the value:

$$R_X = \cos\alpha_p \quad ; \quad R_Y = -\sin\alpha_p \quad ; \quad R_Z = 0 \tag{3.26}$$

The surface normal is defined by the following expression:

$$\vec{N} = n_X \cdot (\hat{e}_X) + n_Y \cdot (\hat{e}_Y) + n_Z(\hat{e}_Z) \tag{3.27}$$

Where the direction cosines of the normal surface were defined previously (equations 3.22, 3.23.3, 3.24).

The refracted angle at the front surface is defined:

$$\theta = \cos^{-1}\left\{\frac{\vec{R} \cdot \vec{N}}{|\vec{R}| \cdot |\vec{N}|}\right\} \tag{3.28}$$

Where:

$$\left.\begin{aligned} |\vec{R}| &= \sqrt{R_X^2 + R_Y^2 + R_Z^2} = 1 \\ |\vec{N}| &= \sqrt{n_X^2 + n_Y^2 + n_Z^2} = 1 \end{aligned}\right\} \tag{3.29}$$

Therefore:

$$\theta = \cos^{-1}\{R_X \cdot n_X + R_Y \cdot n_Y + R_Z \cdot n_Z\} \tag{3.30}$$

$$\left.\begin{aligned} \phi &= \pi - \theta \\ \phi' &= \sin^{-1}[n_{12} \cdot \sin\phi] \end{aligned}\right\} \tag{3.31}$$

3.2.5 Refraction Equations

Referring to figure 6 the refraction at the rear surface with regard to the front surface will be as follows [16, p. 147]:

$$n_2\vec{R}' = n_1\vec{R} + [n_2\cos(\phi') - n_1\cos(\phi)]\vec{N}$$

The direction cosines of the normal surface were defined in

equations (3.22), (3.23.3), (3.24) and the direction cosines of the ray at the front surface were defined in equation (3.26). The direction cosines of the skew ray at the rear surface, will therefore be:

$$\left.\begin{aligned} K' &= n_{12}\, R_Z + [\cos(\phi') - n_{12}\cos(\phi)] \cdot n_X \\ L' &= n_{12}\, R_Y + [\cos(\phi') - n_{12}\cos(\phi)] \cdot n_Y \\ M' &= n_{12}\, R_Z + [\cos(\phi') - n_{12}\cos(\phi)] \cdot n_Z \end{aligned}\right\} \qquad (3.32)$$

3.2.6 Intercept at the Rear Surface

The equation of the cone of the rear surface is:

$$y^2 + z^2 = [ax - b]^2 \qquad (3.33)$$

where a is the slope and is defined from figure 7.

$$a = \tan(\xi_J) = \frac{R_J}{X_J - X_v} = \frac{R_{J+1} - R_J}{X_{J+1} - X_J} \qquad (3.33.1)$$

b is the intercept at the X - axis and is calculated from equation (3.33.1):

$$b = X_v = \frac{R_{J+1} \cdot X_J - R_J \cdot X_{J+1}}{R_{J+1} - R_J} \qquad (3.33.2)$$

(XI, YI, ZI) is the point of intercept at the rear surface. The equation of the rear surface is therefore:

$$YI^2 + ZI^2 - (aXI - b) = 0 \qquad (3.33.3)$$

where a,b were defined in equations (3.33.1), (3.33.2).

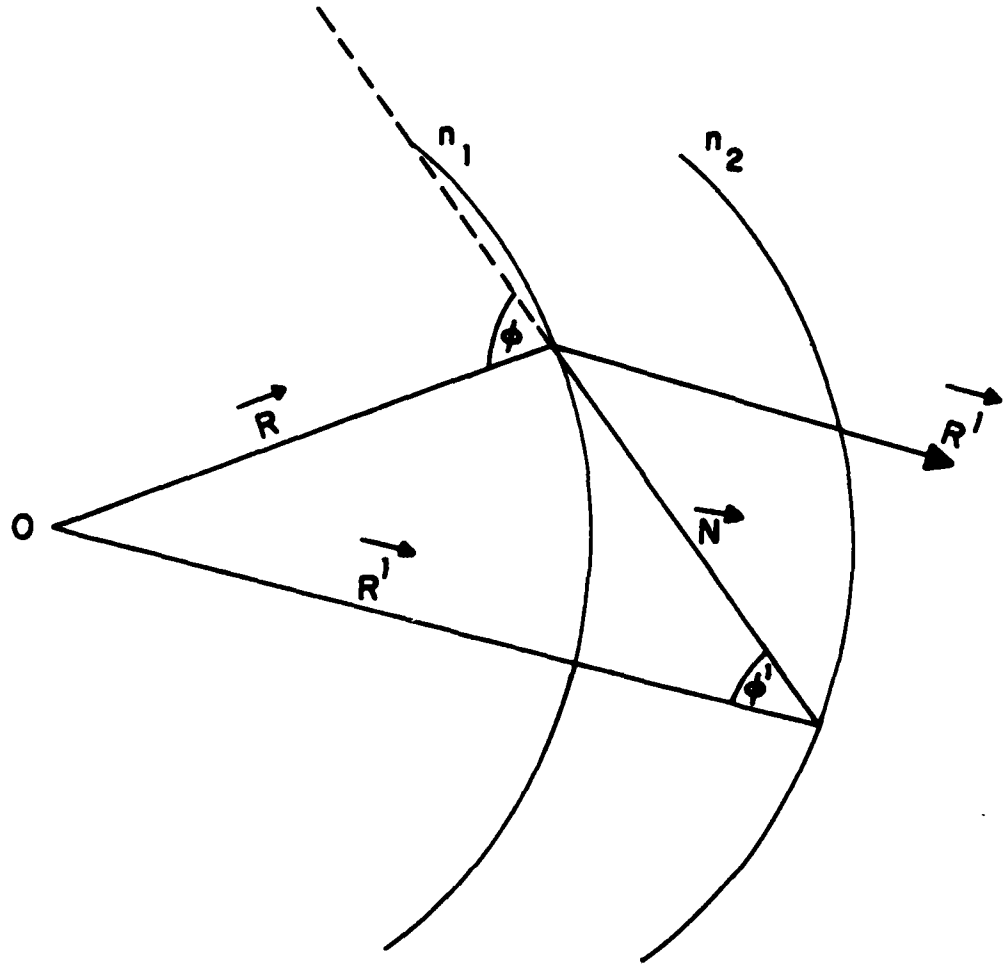


Figure 6. Diagram used to calculate the direction cosines of skew rays at the rear surface. This diagram is based on Kingslake [16].

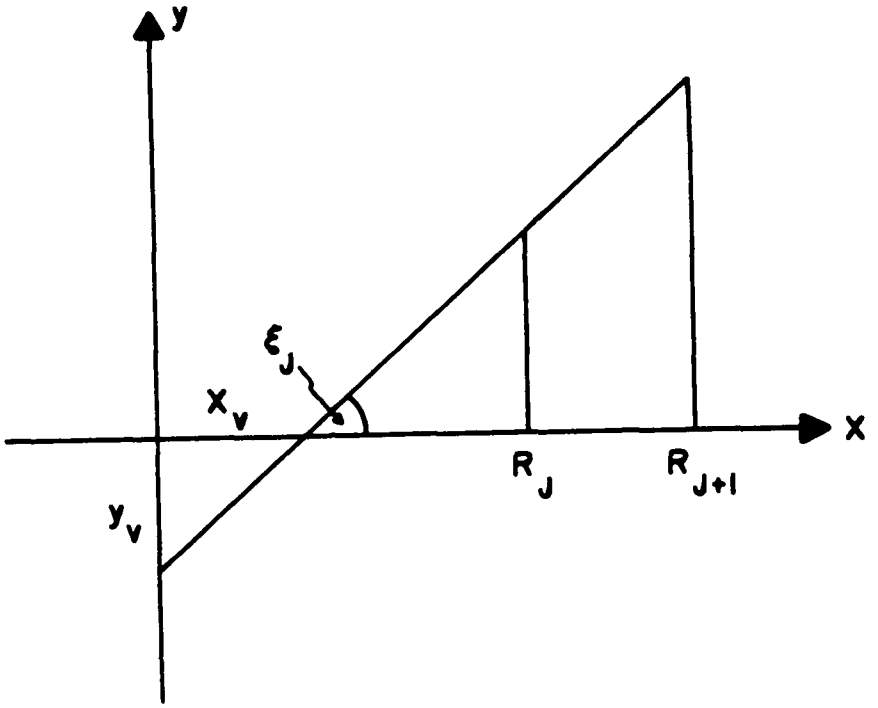


Figure 7. Geometry of a truncated cone which represents a small portion of the rear surface of the lens. The cone angle is ξ_J.

The direction cosines of the ray at the rear surface were defined previously (3.32). They are:

$$K' = \frac{XI - XO}{D} \quad ; \quad L' = \frac{YI - YO}{D} \quad ; \quad M' = \frac{ZI - ZO}{D} \qquad (3.34)$$

(XO, YO, ZO) is the point of intercept at the front surface (3.19.1, 3.19.2, 3.19.3).

$$D = \sqrt{(XI - XO)^2 + (YI - YO)^2 + (ZI - ZO)^2} \qquad (3.35)$$

Solving for D from equations (3.33.3) and (3.34) one gets:

$$D = -\frac{b'}{a'} + \frac{\sqrt{b'^2 - a'c'}}{a'} \qquad (3.36)$$

Where:

$$a' = (L')^2 + (M')^2 - a^2(K')^2 \qquad (3.36.1)$$

$$b' = (L')YO + (M')ZO - (K')a^2(XO - b/a) \qquad (3.36.2)$$

$$c' = YO^2 + ZO^2 - a^2XO(XO - 2b/a) - b^2 \qquad (3.36.3)$$

Knowing D, the intercept point at the rear surface can be verified using equation (3.34):

$$\begin{cases} XI = K'D + XO & (3.37.1) \\ YI = L'D + YO & (3.37.2) \\ ZI = M'D + ZO & (3.37.3) \end{cases}$$

3.2.7 Equation of the Normal to the Rear Surface

The equation of the cone of the rear surface was defined previously (eq. 3.33):

$$f(x,y,z,) = -(ax - b)^2 + y^2 + z^2 = 0 \qquad (3.33)$$

a,b are defined in equations (3.33.1), (3.33.2).

$$\vec{\nabla} f = \hat{e}_X \frac{\delta f}{\delta X} + \hat{e}_Y \frac{\delta f}{\delta Y} + \hat{e}_Z \frac{\delta f}{\delta Z} \tag{3.38.1}$$

Similar to what was done at the front surface:

$$\frac{\delta f}{\delta X} = -2a(ax - b) \tag{3.38.2}$$

$$\frac{\delta f}{\delta Y} = 2y \quad ; \quad \frac{\delta f}{\delta Z} = 2z \tag{3.38.3}$$

$$\begin{aligned} |\vec{\nabla} f| &= [(\tfrac{\delta f}{\delta X})^2 + (\tfrac{\delta f}{\delta Y})^2 + (\tfrac{\delta f}{\delta Z})^2]^{\frac{1}{2}} \\ &= 2[a^2(ax - b)^2 + y^2 + z^2]^{\frac{1}{2}} \\ &= 2(ax - b)[(1 + a^2)^{\frac{1}{2}}] \end{aligned} \tag{3.38.4}$$

The direction cosines of the normal to the surface are as follows:

$$n_X = \frac{(\delta f/\delta X)}{|\vec{\nabla} f|} = \frac{-a}{(1 + a^2)^{\frac{1}{2}}} \tag{3.39.1}$$

$$n_Y = \frac{y}{(y^2 + z^2)^{\frac{1}{2}}(1 + a^2)^{\frac{1}{2}}} \tag{3.39.2}$$

$$n_Z = \frac{z}{(y^2 + z^2)^{\frac{1}{2}}(1 + a^2)^{\frac{1}{2}}} \tag{3.39.3}$$

3.2.8 Refraction at the Rear Surface

Similar to what was done at the front surface:

$$\vec{R}' = K'(\hat{e}_X) + L'(\hat{e}_Y) + M'(\hat{e}_Z) \tag{3.40.1}$$

$$\vec{N} = n_X(\hat{e}_X) + n_Y(\hat{e}_Y) + n_Z(\hat{e}_Z) \tag{3.40.2}$$

Where the direction cosines of the refracted ray ($\vec{R}'$) and the normal ($\vec{N}'$) were defined previously (equations 3.32, 3.39).

The refracted angle at the rear surface:

$$\phi_I = \cos^{-1} \frac{\vec{R}' \cdot \vec{N}'}{|\vec{R}'| \cdot |\vec{N}'|} \tag{3.41}$$

Both the ray and the normal are normalized; therefore:

$$\phi_I = K'n_X + L'n_Y + M'n_Z \tag{3.41.1}$$

$$\phi_I' = \sin^{-1}[n_{23} \cdot \sin\phi_I] \tag{3.41.2}$$

3.2.9 Direction Cosines of Rear External Refracted Ray

As done previously (equation 3.32):

$$\left.\begin{aligned} K'' &= n_{23}K' - [\cos(\phi_I') - n_{23}\cos(\phi_I)] \cdot n_X \\ L'' &= n_{23}L' - [\cos(\phi_I') - n_{23}\cos(\phi_I)] \cdot n_Y \\ Z'' &= n_{23}Z' - [\cos(\phi_I') - n_{23}\cos(\phi_I)] \cdot n_Z \end{aligned}\right\} \tag{3.42}$$

3.2.10 Intersection with the Image Plane

$$\left.\begin{aligned} X_{Im} &= BF = D_3K'' + XI \\ Y_{Im} &= D_3L'' + YI \\ Z_{Im} &= D_3M'' + ZI \end{aligned}\right\} \tag{3.43}$$

Solving equation (3.43), the intercept with the image plane can be calculated:

$$\left.\begin{aligned} D_3 &= (BF - XI)/K'' \\ Y_{Im} &= \left(\frac{BF - XI}{K''}\right) L'' + YI \\ Z_{Im} &= \left(\frac{BF - XI}{K''}\right) M'' + ZI \end{aligned}\right\} \tag{3.43.1}$$

4. FORMULATION OF EQUATIONS FOR GRIN LENS DESIGN

4.1 Solving the Integral for θ_e

As mentioned in section 2:

$$\theta_e = \theta_0 + E\int_{r_f}^{r_r} \frac{d_r}{r\{r^2 n(r)^2 - E^2\}^{\frac{1}{2}}} \tag{4.1}$$

r_f, r_r are the radii to the front surface and to the rear surface, respectively.

$$E = \epsilon \cdot n_2(r_f) \cdot r_f \cdot \sin\psi_f \tag{4.2}$$

$$n = \sqrt{A + B\left(\frac{r}{r_0}\right)^2} \tag{4.3}$$

Substituting:

$$V = \left(\frac{r_0}{r}\right)^2 \quad ; \quad \frac{dV}{dr} = -2r_0{}^2 r^{-3} \tag{4.1.1}$$

Equation (4.1) turns into the form:

$$\theta_e = \theta_0 - \frac{E}{2r_0}\int_{V_f}^{V_r} \frac{dV}{\left\{AV + b - V^2\frac{E^2}{r_0{}^2}\right\}^{\frac{1}{2}}} \tag{4.1.2}$$

Therefore:

$$\theta_e = -\tfrac{1}{2}\left[\sin^{-1}\left\{\frac{2(E/r_0)^2 V - A}{(A^2 + 4BE^2/r_0{}^2)^{\frac{1}{2}}}\right\}\right]_{(r_0/r_f)^2}^{(r_0/r_r)^2}$$

or:

$$\theta_e = -\tfrac{1}{2}\left[\sin^{-1}\left\{\frac{2E^2/r_r{}^2 - A}{(A^2 + 4BE^2/r_0{}^2)^{\frac{1}{2}}}\right\} - \sin^{-1}\left\{\frac{2E^2/r_f{}^2 - A}{(A^2 + 4BE^2/r_0{}^2)^{\frac{1}{2}}}\right\}\right] \tag{4.1.3}$$

The appropriate expression for the radius will therefore be:

$$r_{(r,f)} = \frac{\sqrt{2}|E|}{\sqrt{A + \sqrt{A^2 + 4BE^2/r_0^2}} \cdot \sin\left\{\mp 2\theta_e + \sin^{-1} \frac{2E^2/r_{(f,r)} - A}{\sqrt{A^2 + 4BE^2/r_0^2}}\right\}} \tag{4.4}$$

If the radius to the rear surface (r_r) is calculated from a known radius to the front surface (r_f) the minus sign is used in front of the angle θ_e. This situation occurs with skew ray calculation. The plus sign is used when r_f is calculated from a known r_r. This situation occurs for lens design.

4.2 Meridian Plane

4.2.1 Solution for the First Ray

(a) Define Point $X_1(1), Y_1(1)$

As in the homogeneous case:

$$\left.\begin{aligned} R &= 1.0 \\ Y_1(1) &= R \\ X_1(1) &= \frac{R}{\tan\alpha} \end{aligned}\right\} \tag{4.5}$$

(b) Define Angle to the Front Radius

$$\tan(\theta_0 + \theta_e) = \frac{R}{X_1(1) - X_C} \tag{4.6}$$

$$r_f(1) = r_0 = \frac{R}{\sin(\theta_0(1) + \theta_e(1))} \tag{4.7}$$

Refering to figure 8, θ_0 is the angle to the rear radius, θ_e

is the angle between the rear and the front radii, and X_C is the location of the center of symmetry.

(c) Choose θ_e from Initial Thickness

$$\left.\begin{aligned} \theta_e(1) &= T(1)/r_f(1) \\ \theta_0(1) &= (\theta_0(1) + \theta_e(1)) - \theta_e(1) \end{aligned}\right\} \quad (4.8)$$

(d) Solve for ψ_f

$$\left.\begin{aligned} \alpha + I_1(1) + u &= \pi/2 \\ I_1(1) &= \pi/2 - \alpha - u \end{aligned}\right\} \quad (4.9)$$

Knowing $r_f(1)$, the initial index of refraction $(n_2(r_f))$ can be calculated from eq. (4.3). Therefore:

$$\sin(I_1(1)) = n_2(r_f)/n_3 \cdot \sin(I_1'(1))$$

$$I_1'(1) = \sin^{-1}[n_3/n_2(r_f) \cdot \sin[I_1(1)]] \quad (4.10)$$

Refering to figure 8, ψ_f can be calculated.

$$\theta_e(1) + \theta_0(1) = \alpha + \delta$$

$$\therefore \delta = \theta_e(1) + \theta_0(1) - \alpha \quad (4.11)$$

$$\delta + \psi_f(1) - I_1'(1) = \pi/2$$

$$\psi_f(1) = \pi/2 + I_1'(1) - \delta \quad (4.12)$$

(e) Solve for E

$$E = \epsilon \cdot n_r(r_f) \cdot r_f \cdot \sin\psi_f \quad (4.2)$$

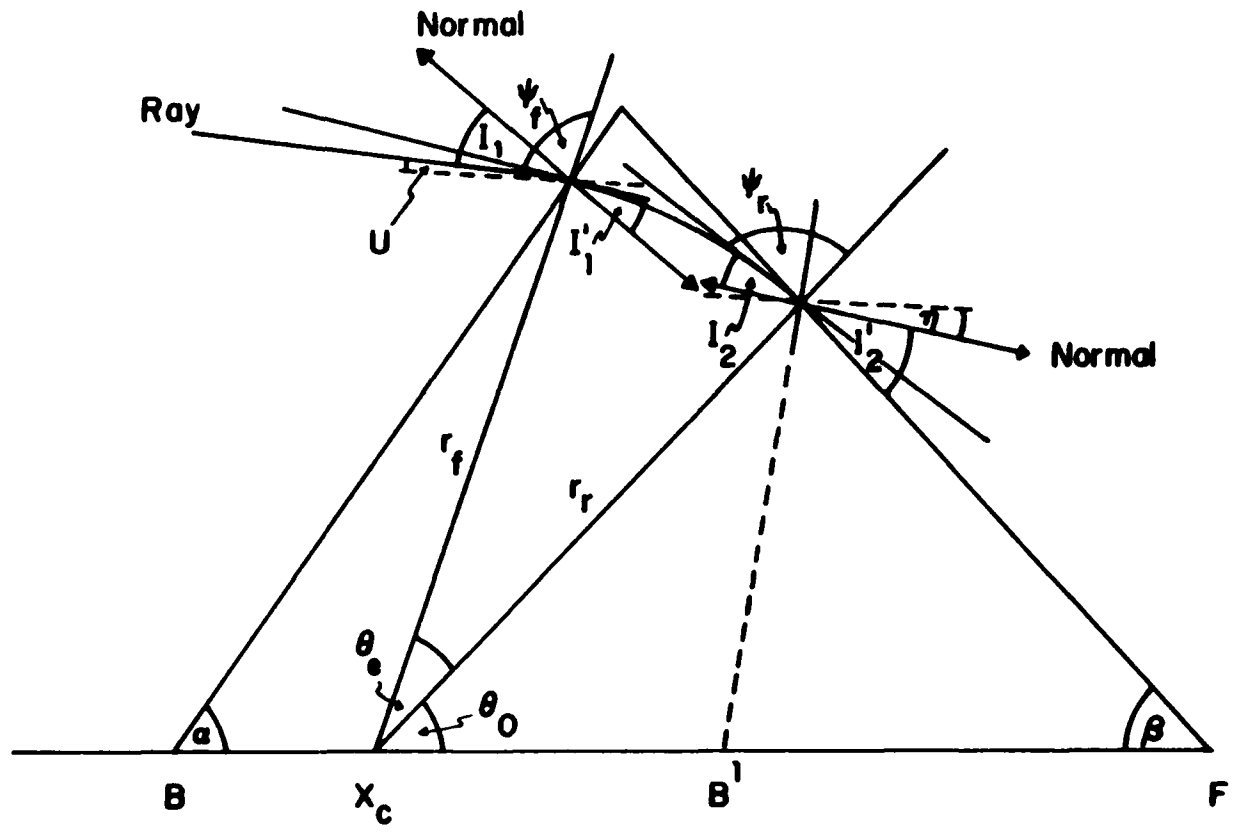


Figure 8. Diagram degining angles and coordinates for a ray transmitted by the GRIN lens. For the case illustrated B is negative.

Where:
$$\epsilon = \pm 1 \begin{cases} \psi \leq \pi/2 \rightarrow \epsilon = +1 \\ \psi > \pi/2 \rightarrow \epsilon = -1 \end{cases} \qquad (4.2.1)$$

(f) Solve for r_f, ψ_r

Knowing the radius to the front surface (r_f) and the angle between the two radii (θ_e), the radius to the rear surface (r_r) can be calculated using equation (4.4). Using equation (4.2), ψ_r can be calculated:

$$\psi_r = \sin^{-1}\left[\frac{E}{\epsilon \cdot n_2(r_r) \cdot r_r}\right] \qquad (4.2.2)$$

(g) Solve for $\beta(1)$

The focal length, which is an input, is known:

$$BF = F/R$$

The coordinates at the rear surface are:

$$\left.\begin{aligned} Y_2(1) &= r_r \sin(\theta_0(1)) \\ X_2(1) &= X_C + r_r \cos(\theta_0(1)) \end{aligned}\right\} \qquad (4.13)$$

Using equation (4.13), $\beta(1)$ can be calculated:

$$\beta(1) = \tan^{-1}\left[\frac{Y_2(1)}{BF - X_2(1)}\right] \qquad (4.14)$$

(h) Solve for the Refractive Angles at the Front Surface

As in the homogeneous case:

$$\eta(J) + I_2'(J) = \beta(J) \tag{4.15}$$

$$\sin[I_2(J)] = n_3/n_2(r_r) \cdot \sin[I_2'(J)] \tag{4.16}$$

$$\psi_r(J) + I_2(J) + \eta(J) + \theta_0(J) = \pi \tag{4.17}$$

Solve for $\eta(J)$ in a manner similar to the homogeneous case:

$$\eta(J) = \sin^{-1}\left[\sqrt{\frac{1}{1 + A^2}}\right] \tag{4.18}$$

Where:
$$A = \frac{\cos\delta' - n_3/n_2(r_r) \cdot \cos\beta(J)}{\sin\delta' - n_3/n_2(r_r) \cdot \sin\beta(J)} \tag{4.18.1}$$

Where:
$$\delta' = \pi - \theta_0(J) - \psi_0(J) \tag{4.18.2}$$

Knowing $\eta(J)$, $I_2'(J)$ can be solved from eq. (4.15) and then, $I_2(J)$ can be solved from equation (4.16).

4.2.2 Solution for Next Rays

4.2.2.1 Coordinates at the Rear Surface

Solve for the subsequent rays the same way as in the homogeneous case (equations 3.10, 3.10.1).

4.2.2.2 Calculate Radius and Angle to the Rear Surface

$$r_r(J) = \sqrt{(X_2(J) - X_C)^2 + Y_2(J)^2} \tag{4.19}$$

$$\theta_0(J) = \tan^{-1}[Y_2(J)/(X_2(J) - X_C)] \tag{4.20}$$

4.2.2.3 Solve Front Surface Parameters

Refer to Figure 8 for a definition of geometrical variables.

(a) Equations

$$\eta(J) + I_2'(J) = \beta(J) \tag{4.15}$$

$$\sin[I_2(J)] = n_3/n_2(r_r) \cdot \sin[I_2'(J)] \tag{4.16}$$

$$\psi_r(J) + I_2(J) + \eta(J) + \theta_0(J) = \pi \tag{4.17}$$

$$E = \varepsilon \cdot n_2(r_r) \cdot r_r \cdot \sin[\psi_r(J)] \tag{4.2.2}$$

$$E = \varepsilon \cdot n_2(r_f) \cdot r_f \cdot \sin[\psi_f(J)] \tag{4.2}$$

$$\theta_e(J) + \theta_0(J) = \alpha + \delta \tag{4.21}$$

$$\delta + \psi_f(J) - I_1'(J) = \pi/2 \tag{4.22}$$

$$r_f = f(r_r, \theta_e(J)) \tag{4.4}$$

$$\sin[I_1(J)] = n_2(r_f)/n_1 \cdot \sin[I_1'(J)] \tag{4.23}$$

$$\alpha + I_1(J) + u = \pi/2 \tag{4.24}$$

(b) Solution by Iteration

An explicit solution is not possible. An iterative solution is necessary.

(b1) Assume $\theta_e(J)$.

(b2) Solve for coordinates of the front surface:

- Calculate $I_1(J)$ from eq. (4.24)
- Calculate δ from eq. (4.21)
- Calculate front surface coordinates and radius:

$$Y_1(J) = \tan(\theta_0(J) + \theta_e(J)) \cdot (X_1(J) - X_C) \quad (4.25)$$

$$Y_1(J) = \tan\alpha \cdot X_1(J) \quad (4.26)$$

The result is:

$$\begin{cases} X_1(J) = \dfrac{X_C \cdot \tan[\theta_0(J) + \theta_e(J)]}{\tan[\theta_0(J) + \theta_e(J)] - \tan\alpha} & (4.27) \\ Y_1(J) = \tan\alpha \cdot X_1(J) & (4.26) \end{cases}$$

$$r_f = Y_1(J)/\sin[\theta_0(J) + \theta_e(J)] \quad (4.28)$$

$$= \frac{X_C \cdot \tan\alpha}{\sin[\theta_0(J) + \theta_e(J)] - \tan\alpha \cdot \cos[\theta_0(J) + \theta_e(J)]} \quad (4.28.1)$$

(b3) Knowing r_f, $I_1'(J)$ can be solved using equation (4.23).

- Calculate ψ_f from eq. (4.22)
- Calculate E from eq. (4.2)

(b4) Calculate second expression for front radius (r_f) from eq. (4.4).

(b5) The iteration routine:

The iteration search for correct θ_e uses the Newton-Raphson routine.

The function:

$$F = r_{ff} - r_f = 0 \quad (4.29)$$

r_{ff} is the expression from the formula (eq. 4.4) where r_f is the geometric expression (eq. 2.28).

The derivative is found with respect to θ_e:

$$F' = \frac{d(r_{ff})}{d(\theta_e)} - \frac{d(r_f)}{d(\theta_e)} \qquad (4.30)$$

$$\frac{d(r_{ff})}{d(\theta_e)} = \pm \frac{(r_{ff})^3}{2E^2} \cdot B_1 \cdot \cos[\mp 2\theta_e + \sin^{-1}(B_2)] \qquad (4.30.1)$$

Where:

$$B_1 = \sqrt{A^2 + 4B(E/r_r)^2} \qquad (4.30.2)$$

$$B_2 = [2(E/r_r)^2 - A]/B_1 \qquad (4.30.3)$$

The lower signs are used when the front radius (r_f) is calculated from a known rear radius (r_r) (this case occurs at $J > 1$), while the upper signs are used when r_r is calculated from r_f (for $J=1$).

$$\frac{d(r_f)}{d(\theta_e)} = \frac{-X_C \cdot \tan\alpha \cdot \{\cos[\theta_0(J) + \theta_e(J)] + \tan\alpha \cdot \sin[\theta_0(J) + \theta_e(J)]\}}{\{\sin[\theta_0(J) + \theta_e(J)] - \tan\alpha \cdot \cos[\theta_0(J) + \theta_e(J)]\}^2} \qquad (4.30.4)$$

(c) Correct Solution

After knowing the correct value for $\theta_e(J)$, the procedure used in (b) can be followed resulting in the correct values for:
$I_1(J)$, δ, $X_1(J)$, $Y_1(J)$, $r_f(J)$, $I_1'(J)$, $\psi_f(J)$, E. Using equation (4.2.2) ψ_r can be calculated. Equations (4.15), (4.16), (4.17) can be solved for $\eta(J)$, $I_2'(J)$, $\beta(J)$ as shown previously for the J=1 case (equations 4.18, 4.15, 4.16).

4.3 Skew Rays

4.3.1 Front Surface

As in the homogeneous sace, the intercept point at the front surface (XO, YO, ZO) can be found (equations 3.19.1, 3.19.2, 3.19.3).

Also, the direction cosines of the normal to the front surface can be calculated (equations 3.22,3.23). The direction cosines of the ray can be found as well using equation (3.26).

4.3.2 Front Radius

Knowing the intercept point at the front surface, the front radius can be calculated:

$$r_f(J) = [(XO - X_C)^2 + (YO)^2 + (ZO)^2]^{\frac{1}{2}} \qquad (4.31)$$

Knowing $r_f(J)$, the initial index of refraction $[n_2(r_f)]$ can be calculated using equation (4.3).

4.3.3 Refraction at the Front Surface

As for the homogeneous case (section 3.2.4), the refracted angle at the front surface can be calculated using equations (3.30), (3.31).

4.3.4 Initial Direction Cosines for the Internal Refracted Ray

The initial direction cosines of the internal refracted ray (K',L',M') are calculated the same way as for the homogeneous case (section 3.2.5, equation 3.32). The vector form of the initial direction of the ray is therefore:

$$\vec{R} = K' \cdot \hat{e}_X + L' \cdot \hat{e}_Y + M' \cdot \hat{e}_Z \qquad (4.32)$$

4.3.5 Front Radius Direction Cosines

The vector form of the front radius is defined as follows:

$$\vec{r}_f = r_{fX} \cdot \hat{e}_X + r_{fY} \cdot \hat{e}_Y + r_{fZ} \cdot \hat{e}_Z \tag{4.33}$$

Where the direction cosines are:

$$\left.\begin{aligned} r_{fX} &= (XO - X_C)/r_f(J) \\ r_{fY} &= YO/r_f(J) \\ r_{fZ} &= ZO/r_f(J) \end{aligned}\right\} \tag{4.33.1}$$

4.3.6 Normal to Plane of the Curved Ray at (XO,YO,ZO)

The vector cross product of $\vec{r}_f$ and $\vec{R}$ is normal to the plane defined by the two vectors.

$$\vec{NP}_f = \vec{r}_f \times \vec{R} = \begin{vmatrix} \hat{e}_X & \hat{e}_Y & \hat{e}_X \\ r_{fX} & r_{fY} & r_{fZ} \\ K' & L' & M' \end{vmatrix} \tag{4.34}$$

$$\vec{NP}_f = NP_{fX} \cdot \hat{e}_X + NP_{fY} \cdot \hat{e}_Y + NP_{fZ} \cdot \hat{e}_Z \tag{4.34.1}$$

Where:

$$\left.\begin{aligned} NP_{fX} &= r_{fY} \cdot M' - r_{fZ} \cdot L' \\ NP_{fY} &= r_{fZ} \cdot K' - r_{fX} \cdot M' \\ NP_{fZ} &= r_{fX} \cdot L' - r_{fY} \cdot K' \end{aligned}\right\} \tag{4.34.2}$$

and

$$NP_f = \sqrt{NP_{fX}^2 + NP_{fY}^2 + NP_{fZ}^2} \tag{4.34.3}$$

The normalized direction cosines of the normal to the plane of the curved ray at (XO,YO,ZO) are therefore:

$$NP_{fX}/NP_f \;;\; NP_{fY}/NP_f \;;\; NP_{fZ}/NP_f \tag{4.34.4}$$

4.3.7 Calculating the Angle Between the Ray and the Front Radius

$$\vec{r}_f \cdot \vec{R} = |\vec{r}_f| \cdot |\vec{R}| \cdot \cos(\psi_f) \tag{4.35}$$

Both the ray and the unit vector for the front surface radius are normalized, i.e.

$$\left.\begin{aligned} |\vec{r}_f| &= (r_{fX}^2 + r_{fY}^2 + r_{fZ}^2)^{\frac{1}{2}} = 1 \\ |\vec{R}| &= (K'^2 + L'^2 + M'^2)^{\frac{1}{2}} = 1 \end{aligned}\right\} \tag{4.35.1}$$

Therefore:

$$\psi_f = \cos^{-1}[\vec{r}_f \cdot \vec{R}]$$

$$= \cos^{-1}[r_{fX} \cdot K' + r_{fY} \cdot L' + r_{fZ} \cdot M'] \tag{4.35.2}$$

4.3.8 Calculating constant E

Knowing ψ_f, constant E can be calculated using equation (4.2).

4.3.9 Intercept Point of the Curved Ray with Rear Surface (Point XI,YI,ZI)

4.3.9.1 Equations

As previously, θ_e is the angle between the front radius and the rear radius.

$$r_{rX} \cdot r_{fX} + r_{rY} \cdot r_{fY} + r_{rZ} \cdot r_{fZ} = \cos[\theta_e(J)] \tag{4.36}$$

The direction cosines of the front radius were calculated in equation (4.33). Similiarly, the direction cosines of the rear radius are:

$$\left.\begin{aligned} r_{rX} &= (XI - X_C / r_r(J) \\ r_{rY} &= YI/r_r(J) \\ r_{rZ} &= ZI/r_r(J) \end{aligned}\right\} \qquad (4.36.1)$$

Therefore, equation (4.36) can have the form:

$$(XI - X_C)r_{fX} + (YI)r_{fY} + (ZI)r_{fZ} = r_r(J) \cdot \cos[\theta_e(J)] \qquad (4.36.2)$$

The rear radius is defined as:

$$(XI - X_C)^2 + (YI)^2 + (ZI)^2 = [r_r(J)]^2 \qquad (4.37)$$

The rear surface was defined previously. Consequently:

$$-(aXI - b)^2 + (YI)^2 + (ZI)^2 = 0 \qquad (3.33)$$

a,b were defined by equations 3.33.1 and 3.33.2.

Also, from geometry:

$$(XI - X_C) = r_r(J) \cdot \cos[\theta_0(J)] \qquad (4.38)$$

Another equation arrives from the connection between the two radii through eq. (4.4).

4.3.9.2 Solution

a. Assume $\theta_e(J)$.

b. Calculate $r_r(J)$ from the formula (equation 4.4).

c. Calculate XI from equation (4.36.2):

$$XI = r_r(J) \cdot \cos[\theta_0(J)] + X_C \qquad (4.36.3)$$

d. Calculate radius from equations

(4.37) and (4.36.3):

$$\text{Radius} = R = [(YI)^2 + (ZI)^2]^{\frac{1}{2}}$$
$$= r_r(J)[1 - \cos^2[\theta_0(J)]]$$
$$= r_r(J) \cdot \sin[\theta_0(J)] \qquad (4.37.1)$$

e. Calculate parameters a and b from equations (3.33.1) and (3.33.2) as in the homogeneous case.

f. Substituting into equation (3.33):

$$XI = (R + b)/a = \{r_r(J) \cdot \sin[\theta_0(J)] + b\}/a \qquad (4.38)$$

where *R is the radius defined in equation* (4.37.1).

g. Solving equations (4.36.3), (4.38) for $\theta_0(J)$ one gets:

$$\theta_0(J) = \sin^{-1}\left[-\frac{B'}{A'} + \frac{\sqrt{(B')^2 - (A')(C')}}{A'}\right] \qquad (4.39)$$

Where:

$$\left.\begin{aligned} A' &= [r_r(J)]^2(1 + a^2) \\ B' &= [r_r(J)](b - a \cdot X_C) \\ C' &= (b - a \cdot X_C)^2 - a^2 \cdot [r_r(J)]^2 \end{aligned}\right\} \qquad (4.40)$$

h. Knowing $\theta_0(J)$, it is possible to calculate new value for $\theta_e(J)$ and iterate through steps (a) - (g) until the difference in the values of $\theta_0(J)$ is

small enough.

i. When an accurate value of $\theta_0(J)$ is received, XI is calculated from equation (4.36.3). YI and ZI are calculated using equations (4.36) and (4.37.1). Consequently:

$$\left.\begin{aligned} YI &= \frac{B''}{A''} + \frac{\sqrt{(B'')^2 - (A'')(C'')}}{A''} \\ ZI &= \sqrt{\{r_r(J) \cdot \sin[\theta_0(J)]\}^2 - \{YI\}^2} \end{aligned}\right\} \qquad (4.41)$$

Where:

$$\left.\begin{aligned} A'' &= 1 + [r_{fY}]^2/[r_{fZ}]^2 \\ B'' &= \{r_r(J) \cdot \cos[\theta_e(J)] - (XI - X_C) r_{fX}\} r_{fY}/r_{fZ} \\ C'' &= \left\{\frac{r_r(J)}{r_{fZ}} \cdot \cos[\theta_e(J)] - (XI - X_C)\frac{r_{fX}}{r_{fZ}}\right\}^2 - \left\{r_r(J) \cdot \sin[\theta_0(J)]\right\}^2 \end{aligned}\right\} \qquad (4.42)$$

When $r_{fZ} = 0$, the solution for YI and ZI is different:

$$YI = \{r_r(J) \cdot \cos[\theta_e(J)] - (XI - X_C) r_{fX}\}/r_{fY} \qquad (4.43)$$

While ZI is calculated by equation (4.41).

4.3.10 Direction Cosines of the Ray at the Rear Surface

a. Similarly to what was done at the front surface (equation 4.35):

$$\vec{r}_r \cdot \vec{R} = |\vec{r}_r| \cdot |\vec{R}| \cdot \cos(\psi_r) \qquad (4.44)$$

Both the ray and the rear radius are normalized; therefore:

$$r_{rX} \cdot K_r' + r_{rY} \cdot L_r' + r_{rZ} \cdot M_r' = \cos\psi_r \qquad (4.44.1)$$

b. The ray remains within the same plane while transfering from the front surface to the rear surface. i.e.:

$$NP_{fX} \cdot K_r' + NP_{fY} \cdot L_r' + NP_{fZ} \cdot M_r' = \cos(\pi/2) = 0 \qquad (4.45)$$

c. The direction cosines of the ray are normalized, i.e.

$$(K_r')^2 + (L_r')^2 + (M_r')^2 = 1 \qquad (4.46)$$

d. Solution:

(d1) $NP_{fX} \neq 0,\ NP_{fY} \neq 0,\ NP_{fZ} \neq 0$

$$\left.\begin{aligned} (L'_r) &= \frac{B''}{2A''} \pm \frac{\sqrt{(B'')^2 - 4(A'')(C'')}}{2A''} \\ (M'_r) &= \frac{C}{B} - \frac{A}{B}(L'_r) \\ (K'_r) &= [-NP_{fY} \cdot (L'_r) - NP_{fZ} \cdot (M'_r)]/NP_{fX} \end{aligned}\right\} \qquad (4.47)$$

Where:

$$\left.\begin{aligned} A &= NP_{fX} \cdot r_{rY} - NP_{fY} \cdot r_{rX} \\ B &= NP_{fX} \cdot r_{rZ} - NP_{fZ} \cdot r_{rX} \\ C &= NP_{fX} \cdot \cos(\psi_r) \\ A' &= \left(\frac{NP_{fY}}{NP_{fX}}\right)^2 + 1 \\ B' &= \left(\frac{NP_{fZ}}{NP_{fX}}\right)^2 + 1 \\ C' &= \frac{2(NP_{fY})(NP_{fZ})}{(NP_{fX})^2} \end{aligned}\right\} \qquad (4.48)$$

$$\left.\begin{aligned} A'' &= (A') + (B')\left(\frac{A}{B}\right)^2 - \frac{(C')(A)}{(B)} \\ B'' &= \frac{2(A)(C)(B')}{(B)^2} - \frac{(C')(C)}{(B)} \\ C'' &= (B')\left(\frac{C}{B}\right)^2 - 1 \end{aligned}\right\} \qquad (4.48)$$

In (4.47) the (+) sign is used when $r_{rY} < 0$ while the (-) sign is used when $r_{rY} \geq 0$.

(d2) In the above case, when $\underline{B = 0}$ (look for definition of B in equation (4.48)) the solution for direction cosines of the ray is different.

$$\left.\begin{aligned} (L'_r) &= \frac{C}{A} \\ (M'_r) &= -\frac{(C')(L'_r)}{2(B')} \pm \frac{\sqrt{\left[\frac{(C')(L'_r)}{2}\right]^2 - (B')[(A')(L'_r)^2 - 1]}}{B'} \\ (K'_r) &= [-NP_{fY} \cdot (L'_r) - NP_{fZ} \cdot (M'_r)]/NP_{fX} \end{aligned}\right\} \qquad (4.49)$$

All the symbols used here were defined in equation (4.48) and the ± sign is used as before.

(d3) $\underline{NP_{fX} = 0,\ NP_{fY} = 0,\ NP_{fZ} \neq 0,\ r_{rY} \neq 0}$

$$(M'_r) = 0 \qquad (4.50)$$

$$\left.\begin{aligned} (K'_r) &= \frac{B''}{A''} \pm \frac{\sqrt{(B'')^2 - (A'')(C'')}}{A''} \\ (L'_r) &= \frac{1}{r_{rY}} [\cos(\psi_r) - r_{rX} \cdot K'_r] \end{aligned}\right\} \qquad (4.50)$$

The (+) sign is used here.

While in this case:

$$\left.\begin{aligned} A'' &= 1 + \left(\frac{r_{rX}}{r_{rY}}\right)^2 \\ B'' &= \cos(\psi_r) \frac{r_{rX}}{(r_{rY})^2} \\ C'' &= \left[\frac{\cos(\psi_r)}{r_{rY}}\right]^2 - 1 \end{aligned}\right\} \qquad (4.51)$$

(d4) In the above case, when $r_{rY} = 0$ the solution is:

$$\left.\begin{aligned} (M'_r) &= 0 \\ (K'_r) &= \frac{\cos(\psi_r)}{r_{rX}} \\ (L'_r) &= \pm\sqrt{1 - (K'_r)^2} \end{aligned}\right\} \qquad (4.52)$$

Again, the (+) sign is used here.

(d5) $NP_{fX} = 0$, $NP_{fY} \neq 0$, $NP_{fZ} = 0$, $r_{rZ} \neq 0$

The solution is similar to that in case (d3).

$$\left.\begin{aligned} (L'_r) &= 0 \\ (K'_r) &= \frac{B''}{A''} \pm \frac{\sqrt{(B'')^2 - (A'')(C'')}}{(A'')} \\ (M'_r) &= \frac{1}{r_{rZ}} [\cos(\psi_r) - r_{rX} \cdot K'_r] \end{aligned}\right\} \qquad (4.53)$$

(A''), (B''), (C'') are the same as defined in (4.51) except that r_{rY} is replaced everywhere by r_{rZ}. The (+) sign is used here.

(d6) In the above case, when $r_{rZ} = 0$ the solution is similar to that in case (d4):

$$\left.\begin{aligned} (L'_r) &= 0 \\ (K'_r) &= \frac{\cos(\psi_r)}{r_{rX}} \\ (M'_r) &= \pm\sqrt{1 - (K'_r)^2} \end{aligned}\right\} \qquad (4.54)$$

Also here, the (+) sign is used.

(d7) $NP_{fX} = 0$, $NP_{fY} \neq 0$, $NP_{fZ} \neq 0$, $r_{rX} = 0$

$$\left.\begin{aligned} (L'_r) &= \frac{\cos(\psi_r)}{r_{rY} - \frac{NP_{fY}}{NP_{fZ}} \cdot r_{rZ}} \\ (M'_r) &= -\frac{NP_{fY}}{NP_{fZ}} (L'_r) \\ (K'_r) &= \pm\sqrt{1 - (L'_r)^2 - (M'_r)^2} \end{aligned}\right\} \qquad (4.55)$$

The (+) sign is used here.

(d8) As in (d7), but: $(r_{rY} - \frac{NP_{fY}}{NP_{fZ}} \cdot r_{rZ}) = 0$; $r_{rX} \neq 0$

$$\left.\begin{aligned} (K'_r) &= \frac{\cos(\psi_r)}{r_{rX}} \\ (L'_r) &= \pm \sqrt{\frac{1 - (K'_r)^2}{1 + \left(\frac{NP_{fY}}{NP_{fZ}}\right)^2}} \\ (M'_r) &= -\frac{NP_{fY}}{NP_{fZ}} (L'_r) \end{aligned}\right\} \quad (4.56)$$

(d9) As in (d7), but: $r_{rX} \neq 0$

$$\left.\begin{aligned} (L'_r) &= \frac{(B")}{2(A")} \pm \frac{\sqrt{(B")^2 - 4(A")(C")}}{2(A")} \\ (M'_r) &= -\frac{NP_{fY}}{NP_{fZ}} (L'_r) \\ (K'_r) &= \frac{1}{r_{rX}} \left[\cos(\psi_r) - (r_{rY} - \frac{NP_{fY}}{NP_{fZ}} r_{rZ})(L'_r)\right] \end{aligned}\right\} \quad (4.57)$$

As in case (d1), the (+) sign is used when: $r_{rY} < 0$ while the (-) sign is used when: $r_{rY} \geq 0$.

5. FLOW CHART OF PROGRAM LENS

(Homogeneous Case)

Note: Subroutines SHAPET, SKEWT compute the shape of lens and the skew rays as described in the previous sections (3,4). However, subroutines SHAPEC, SKEWC compute the shape and the skew rays of a different design of the lens. In this design, the fixed cone is the rear surface instead of the front surface (compare figure 9 to figure 2.). The equations for this different design are not included in the current report. The equations are part of Capt. Carr's thesis [15] and will be described there.

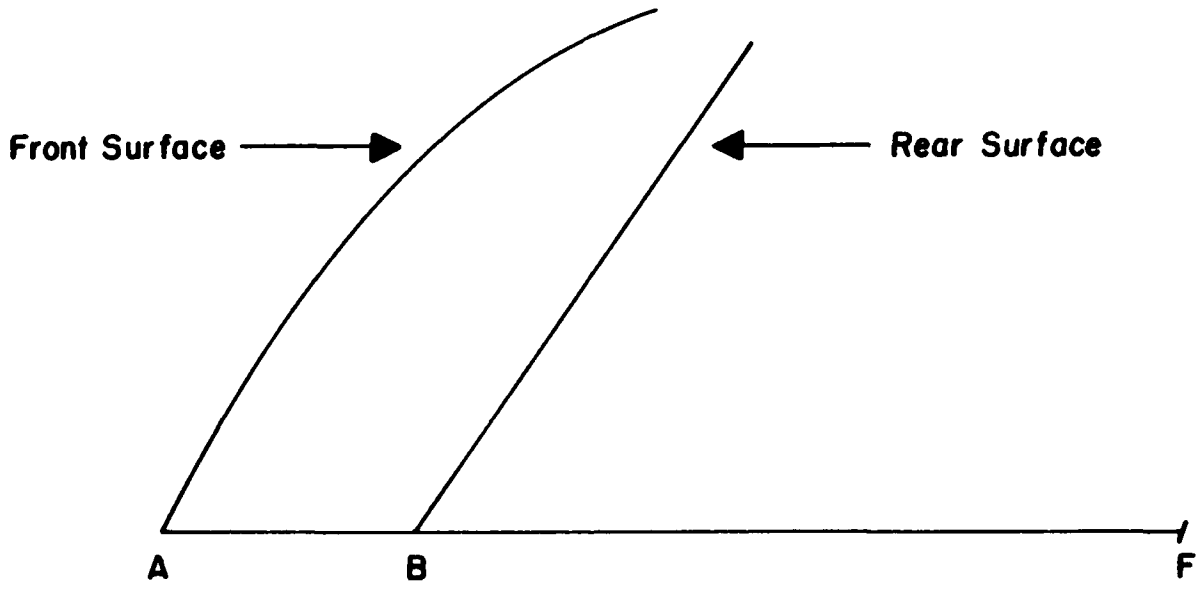
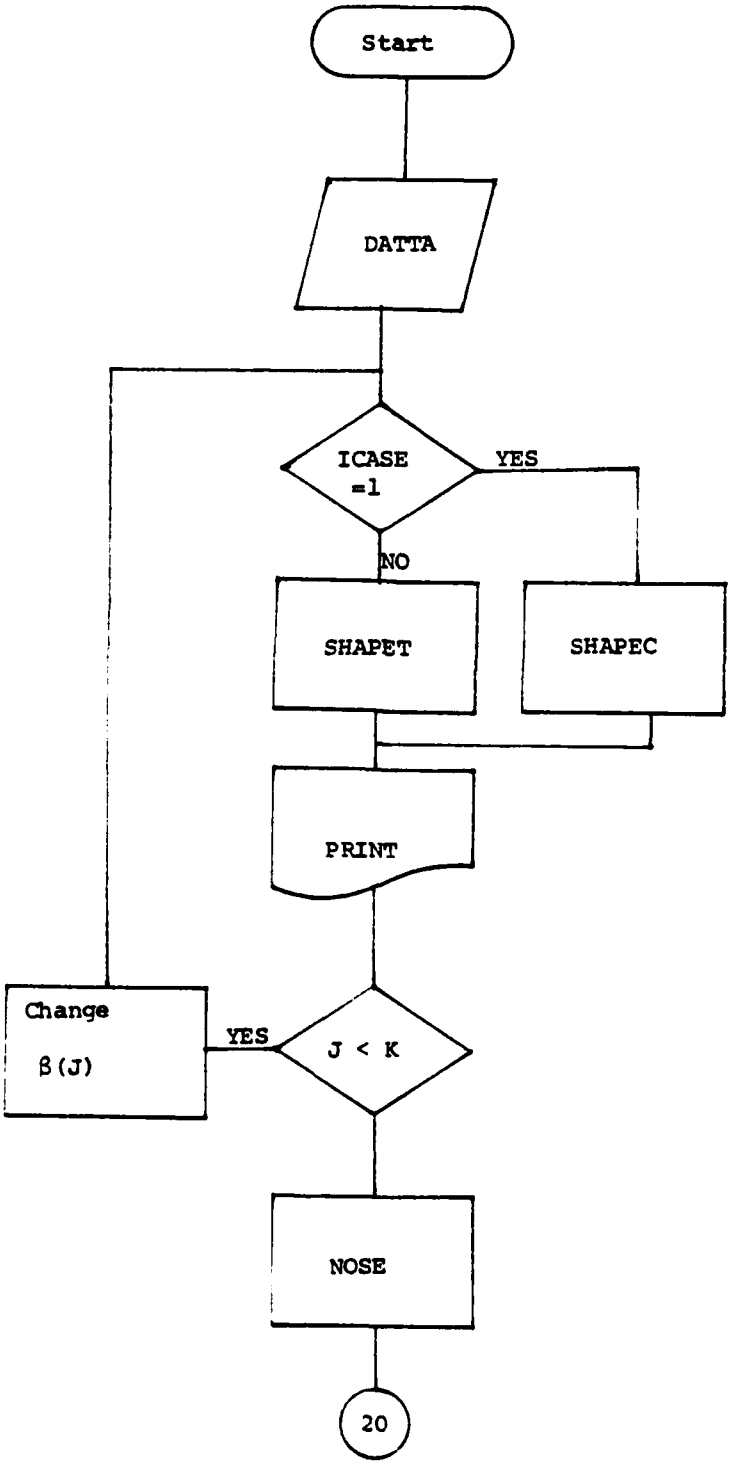
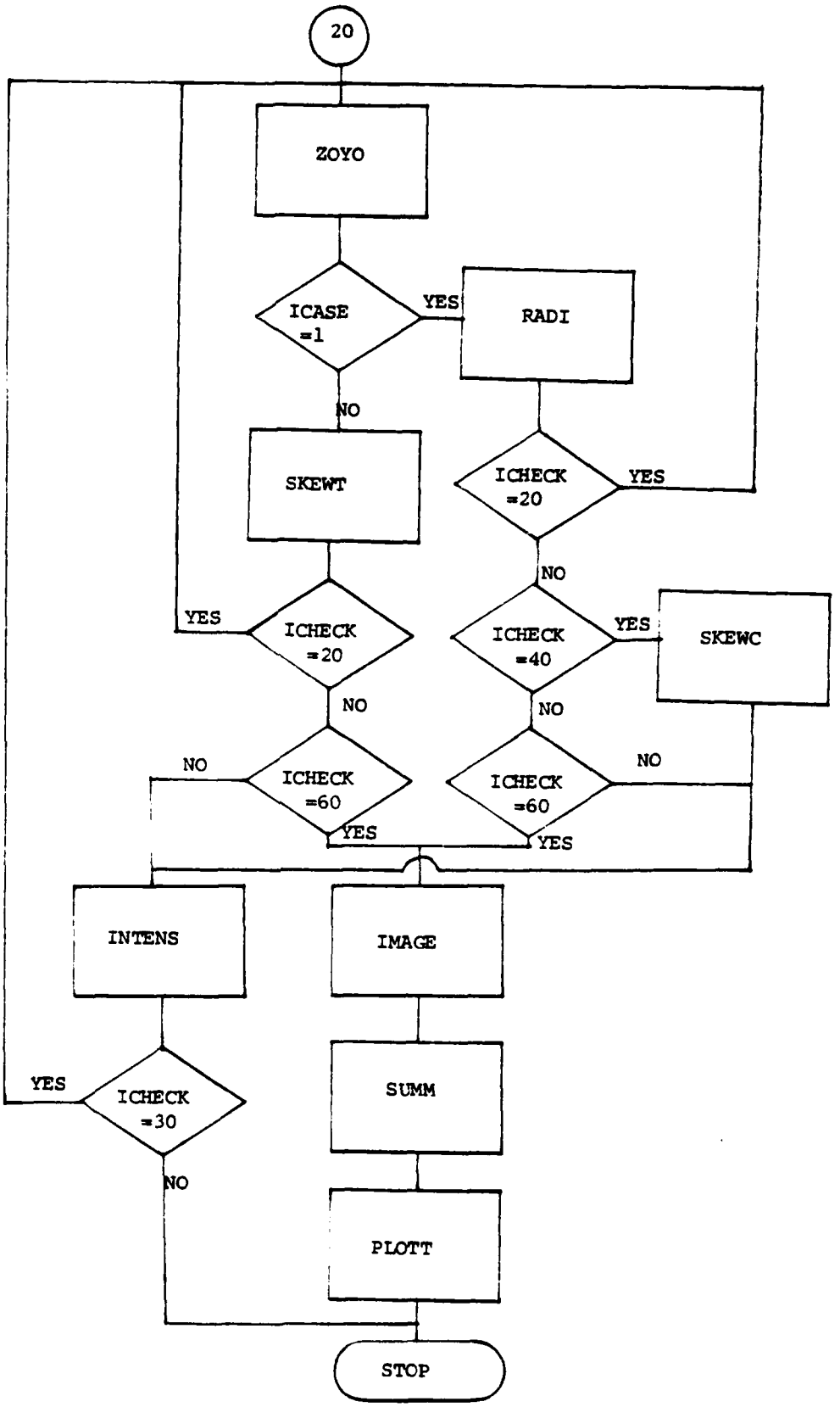
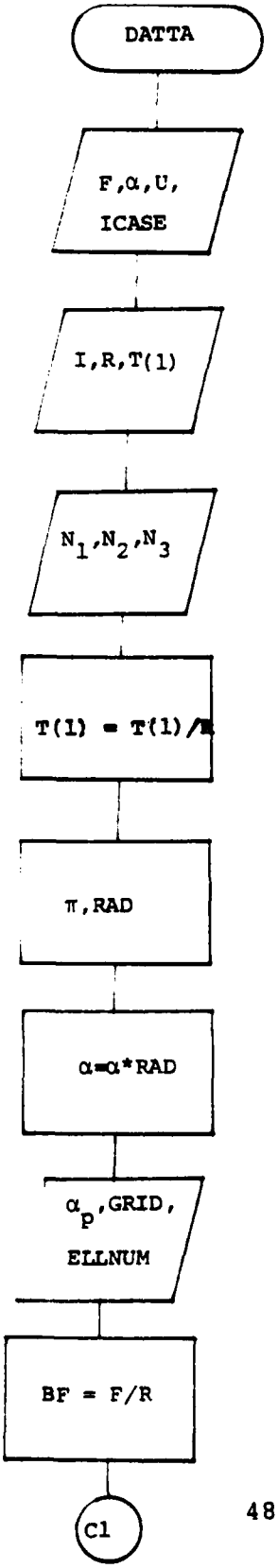


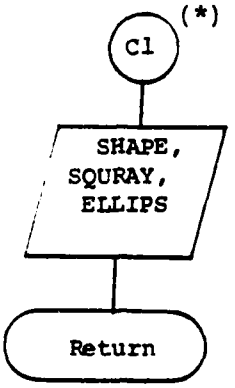
Figure 9. Illustration of the lens which has a circular cone on the inside surface.

Program LENS - Main

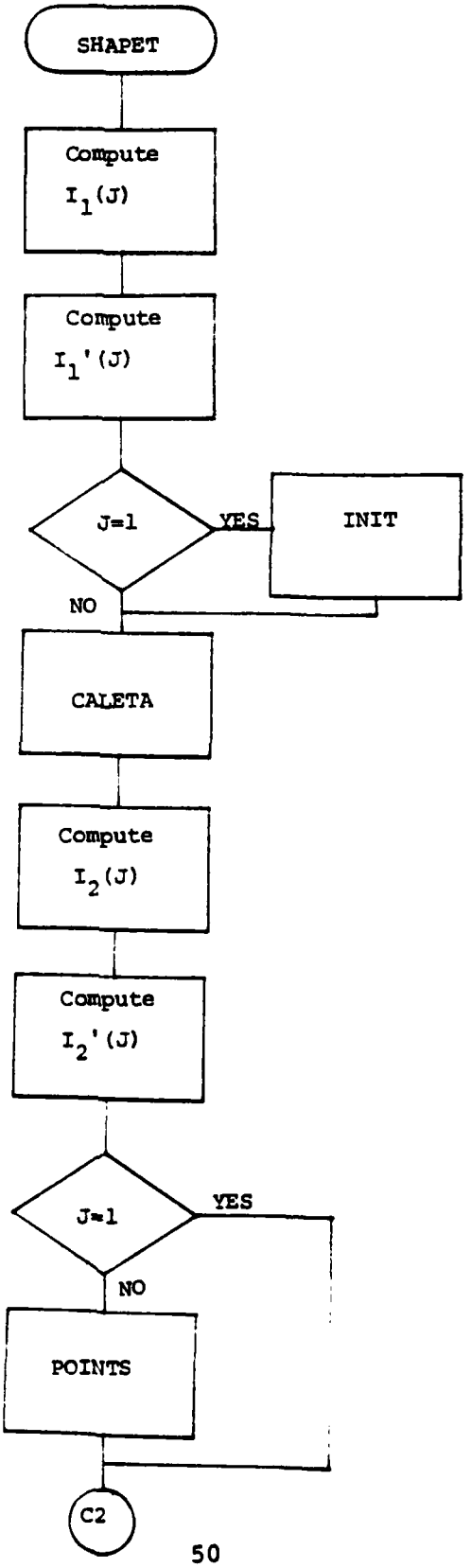


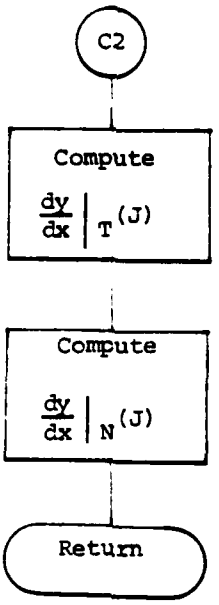

20
ZOYO
ICASE =1
YES
RADI
NO
SKEWT
ICHECK =20
YES
NO
YES
ICHECK =20
ICHECK =40
YES
SKEWC
NO
NO
NO
ICHECK =60
ICHECK =60
NO
YES
YES
INTENS
IMAGE
YES
ICHECK =30
SUMM
NO
PLOTT
STOP

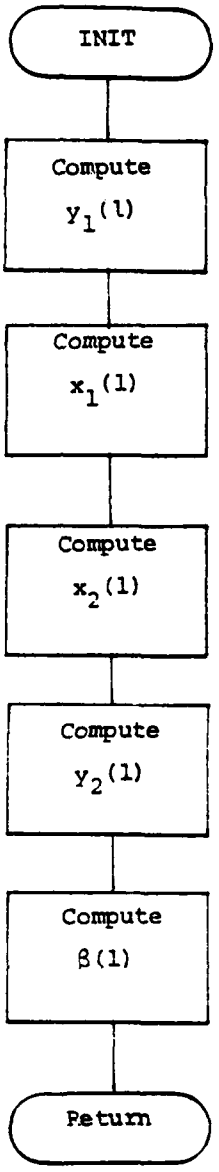

DATTA
F,α,U,
ICASE
I,R,T(1)
N_1,N_2,N_3
T(1) = T(1)/
π,RAD
α=α*RAD
α_p,GRID,
ELLNUM
BF = F/R
C1

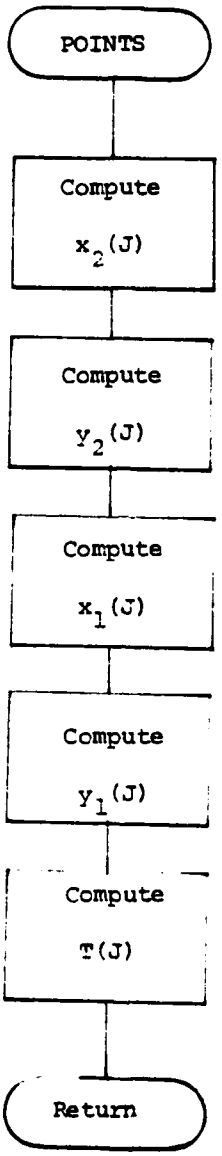


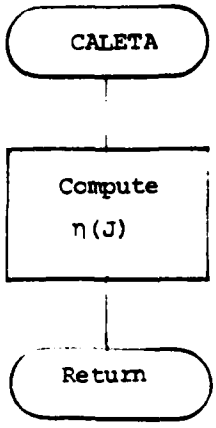
(*) In program GRIN, which uses the same subroutine, here, data for XC, DIV is given.

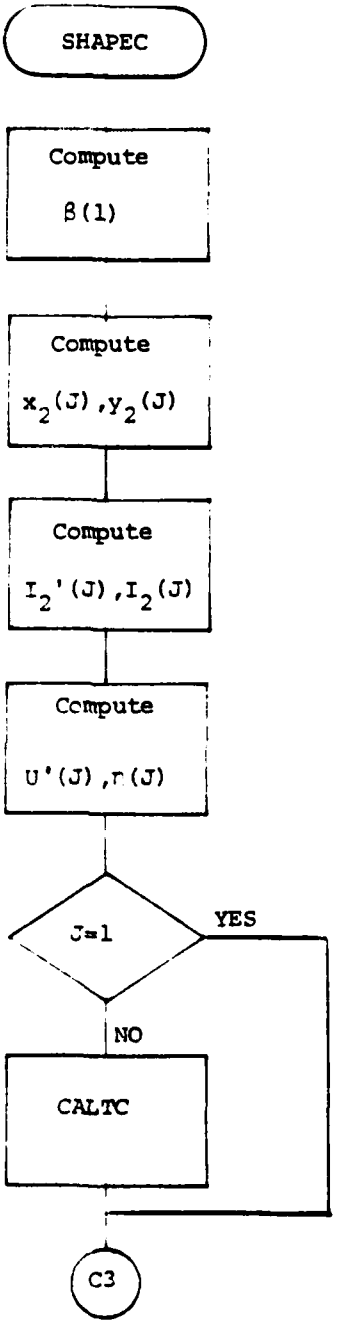

SHAPET
Compute $I_1(J)$
Compute $I_1'(J)$
J=1
YES
INIT
NO
CALETA
Compute $I_2(J)$
Compute $I_2'(J)$
J=1
YES
NO
POINTS
C2

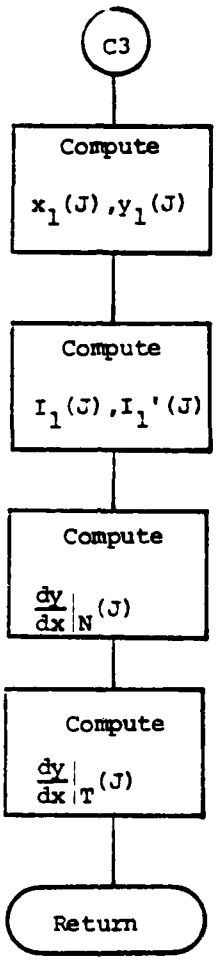

C2
Compute
$\frac{dy}{dx}\Big|_T(J)$
Compute
$\frac{dy}{dx}\Big|_N(J)$
Return

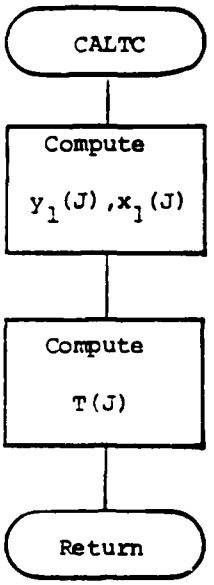

INIT
Compute
$y_1(1)$
Compute
$x_1(1)$
Compute
$x_2(1)$
Compute
$y_2(1)$
Compute
$\beta(1)$
Return

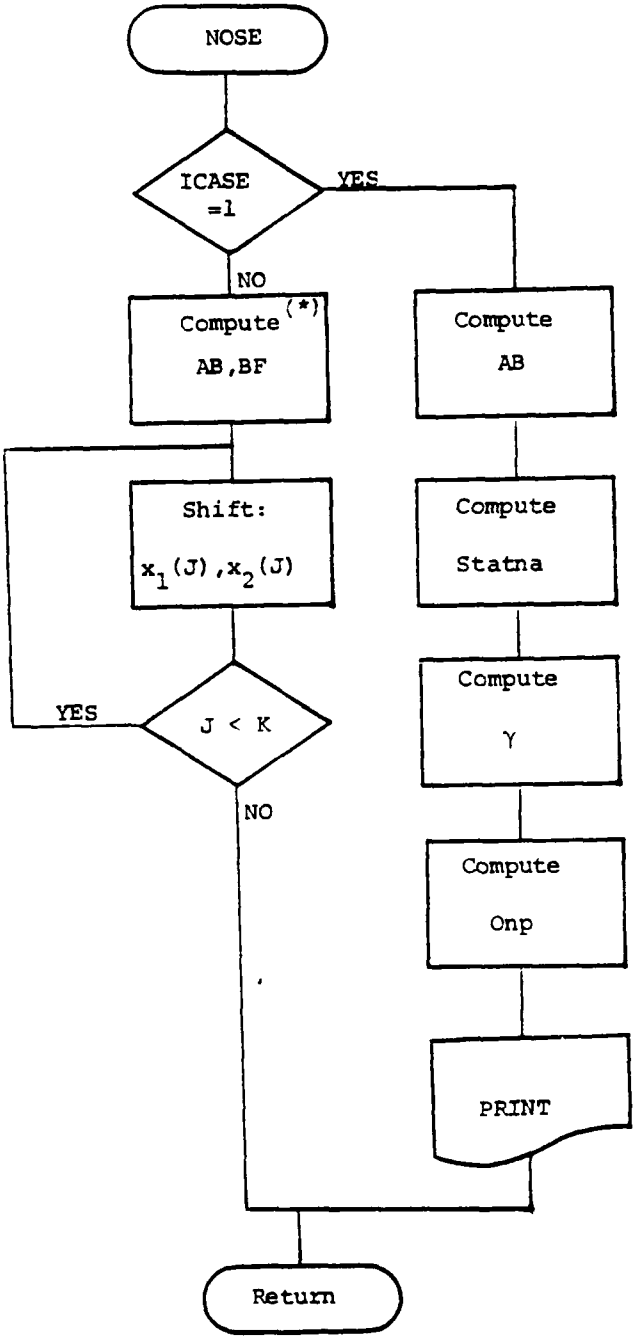

POINTS
Compute
$x_2(J)$
Compute
$y_2(J)$
Compute
$x_1(J)$
Compute
$y_1(J)$
Compute
T(J)
Return


CALETA
Compute
η(J)
Return

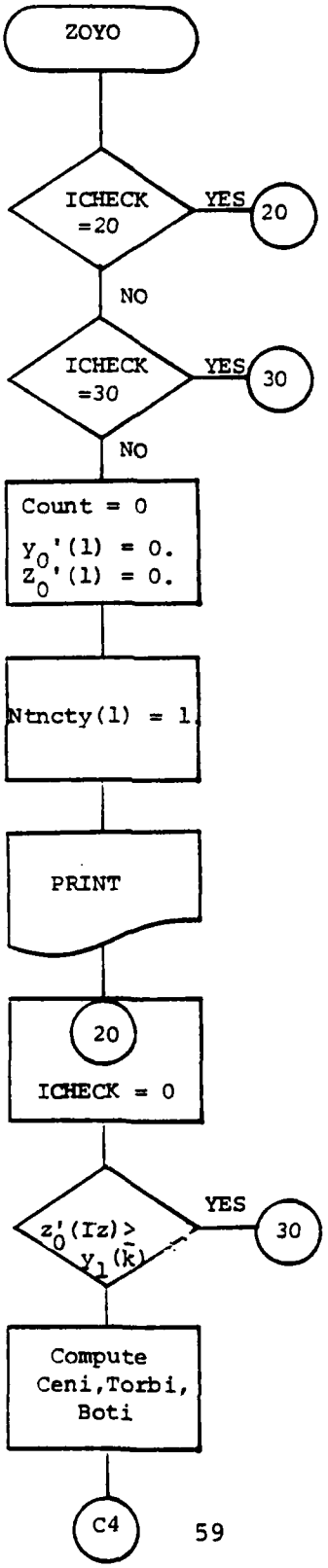

SHAPEC
Compute
β(1)
Compute
$x_2(J), y_2(J)$
Compute
$I_2'(J), I_2(J)$
Compute
U'(J), r(J)
J=1
YES
NO
CALTC
C3

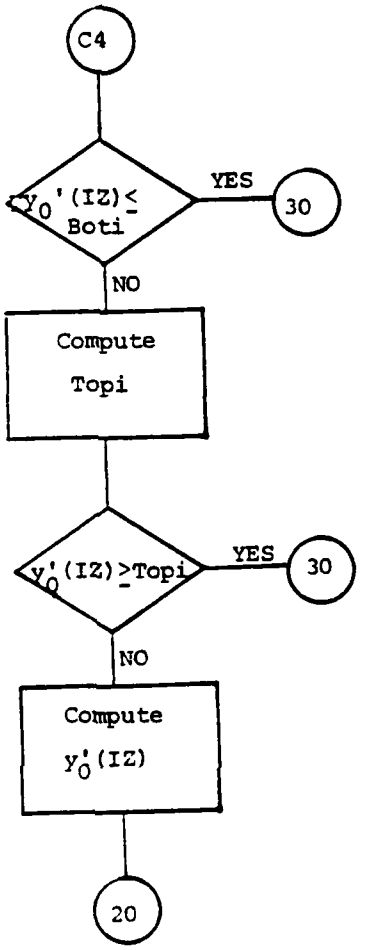

C3
Compute
$x_1(J), y_1(J)$
Compute
$I_1(J), I_1'(J)$
Compute
$\frac{dy}{dx}\Big|_N(J)$
Compute
$\frac{dy}{dx}\Big|_T(J)$
Return

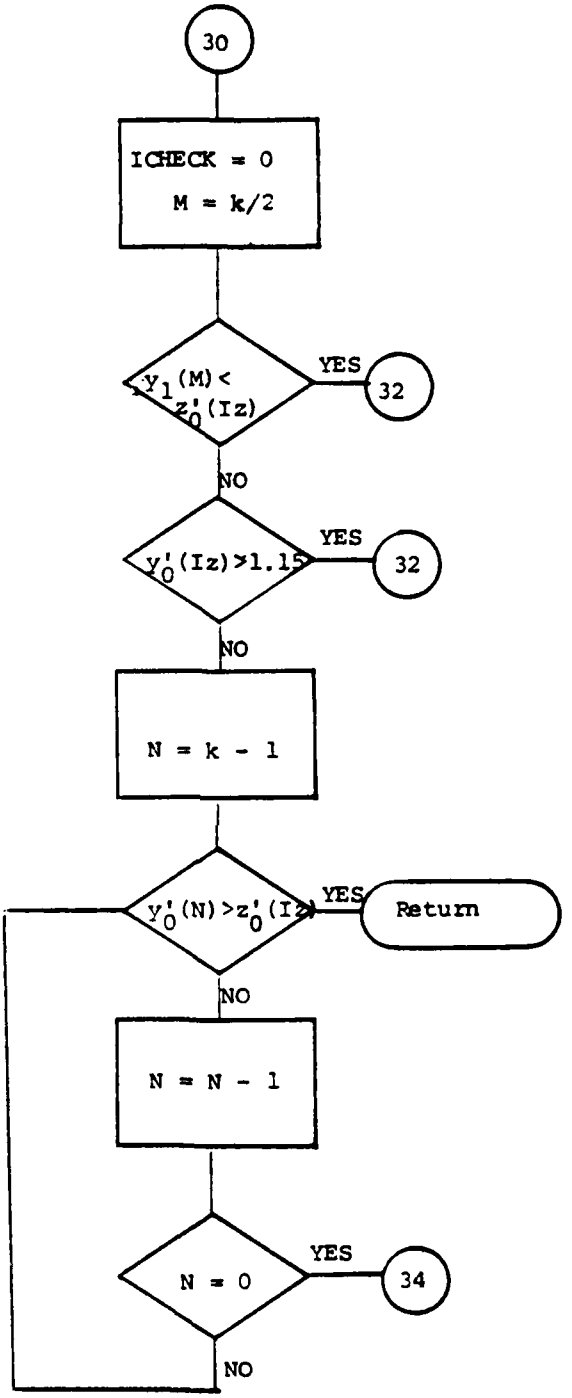

CALTC
Compute
$y_1(J), x_1(J)$
Compute
T(J)
Return

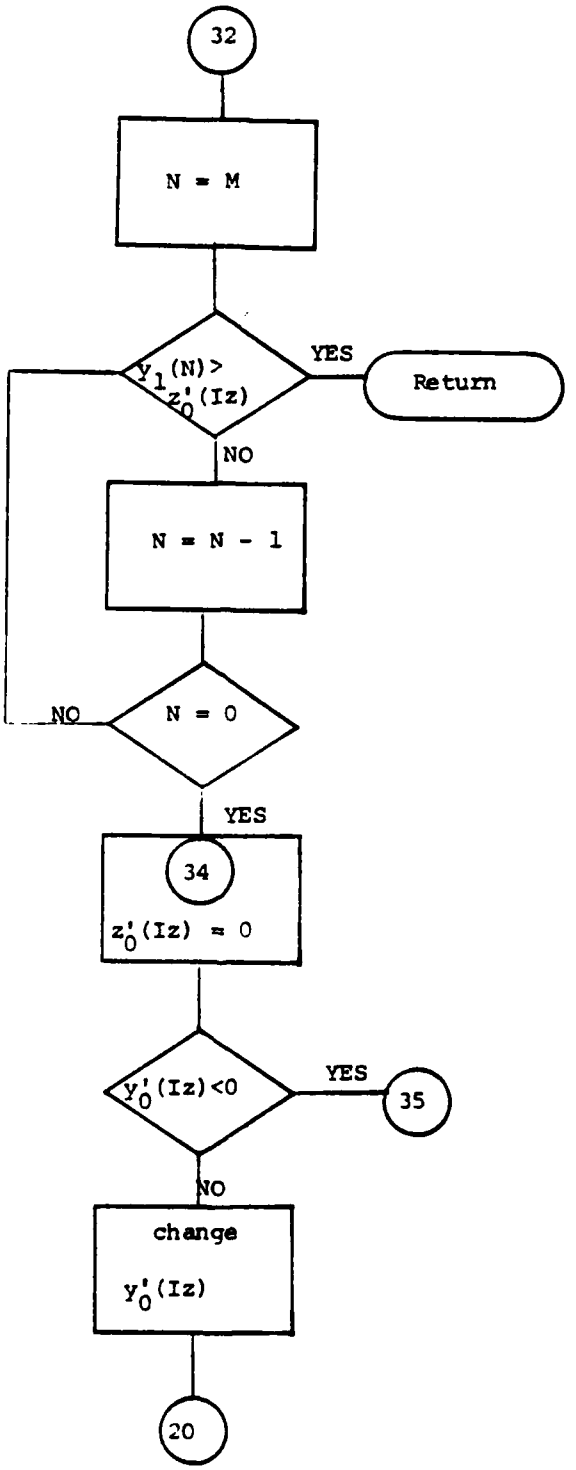


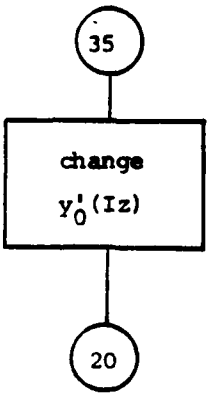
(*) In program GRIN, which uses the same subroutine, here, also xc is shifted.

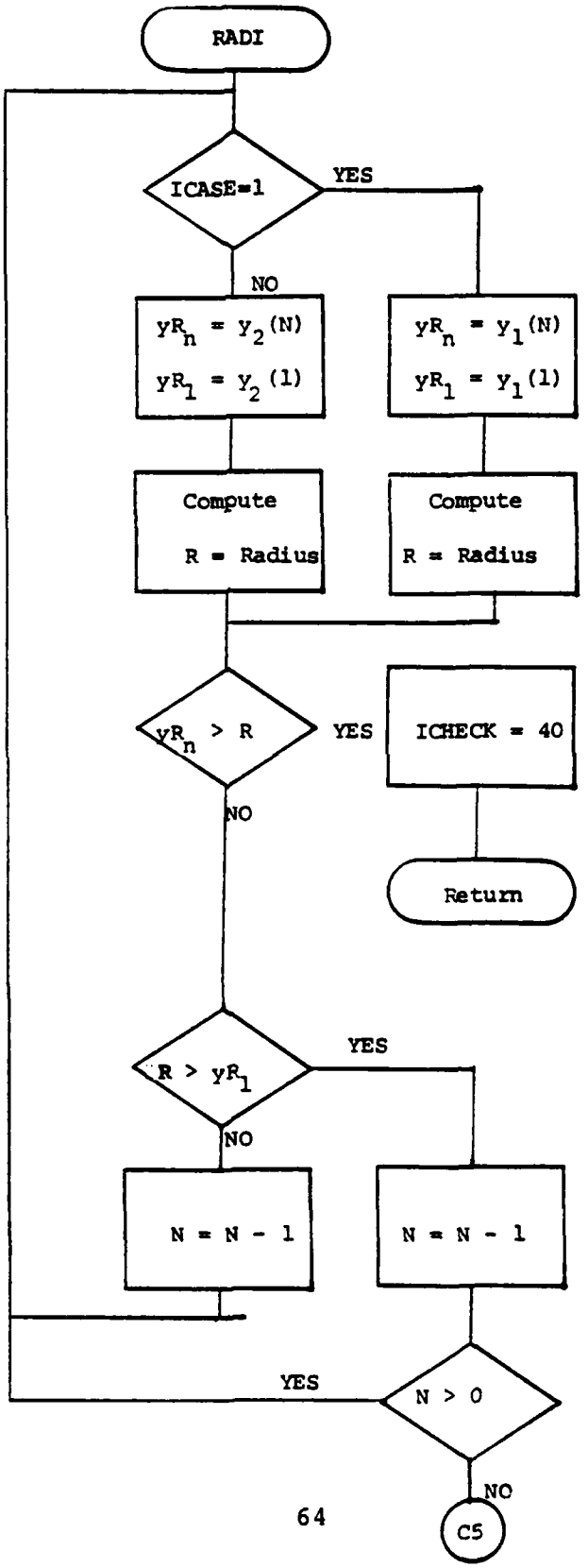

ZOYO
ICHECK =20
YES
20
NO
ICHECK =30
YES
30
NO
Count = 0
$y_0'(1) = 0.$
$z_0'(1) = 0.$
Ntncty(1) = 1
PRINT
20
ICHECK = 0
$z_0'(Iz) \geq y_1(k)$
YES
30
Compute Ceni,Torbi, Boti
C4

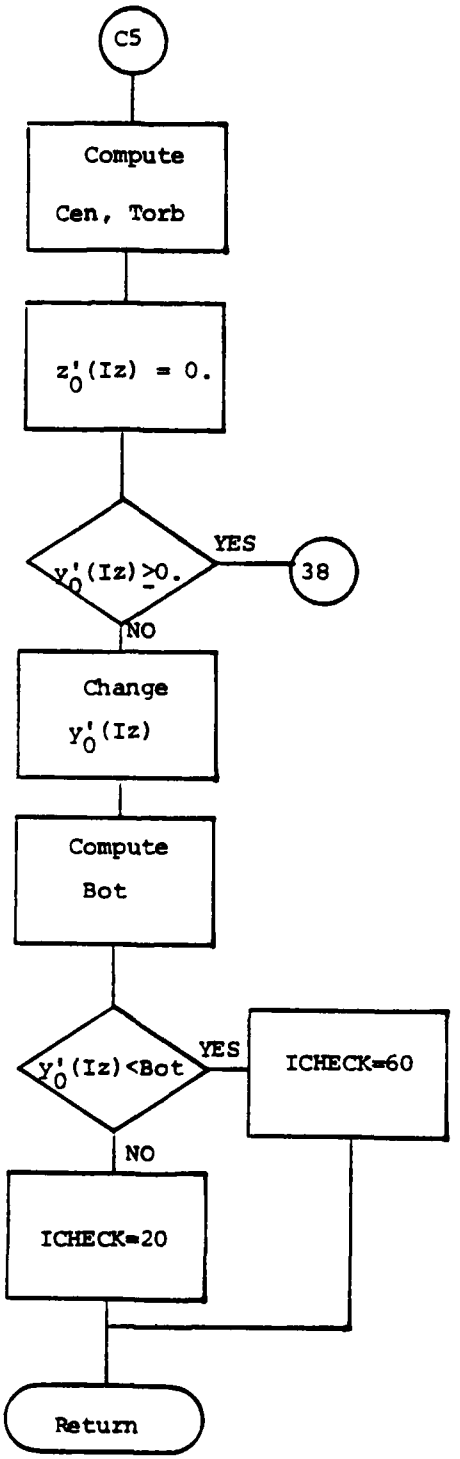

C4
$y_0'(IZ) \leq$ Boti
YES
30
NO
Compute Topi
$y_0'(IZ) \geq$ Topi
YES
30
NO
Compute $y_0'(IZ)$
20

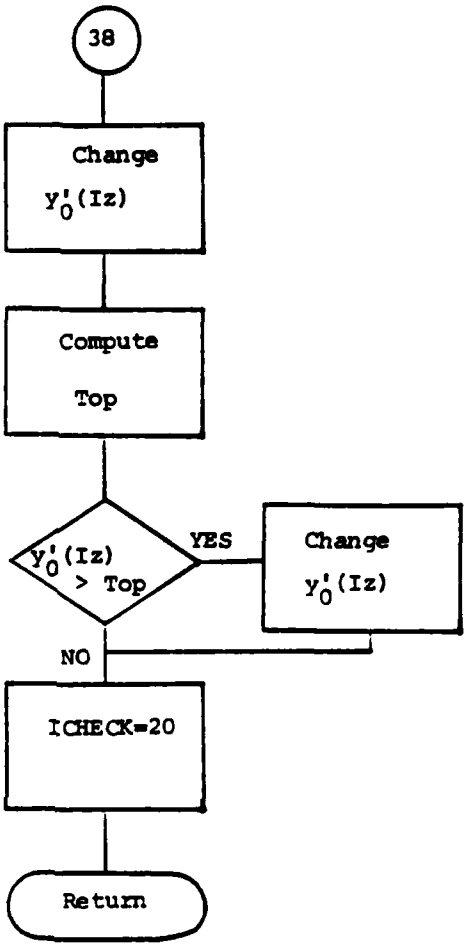

30
ICHECK = 0
M = k/2
$y_1(M) < z_0'(Iz)$
YES
32
NO
$y_0'(Iz) > 1.15$
YES
32
NO
N = k - 1
$y_0'(N) > z_0'(Iz)$
YES
Return
NO
N = N - 1
N = 0
YES
34
NO

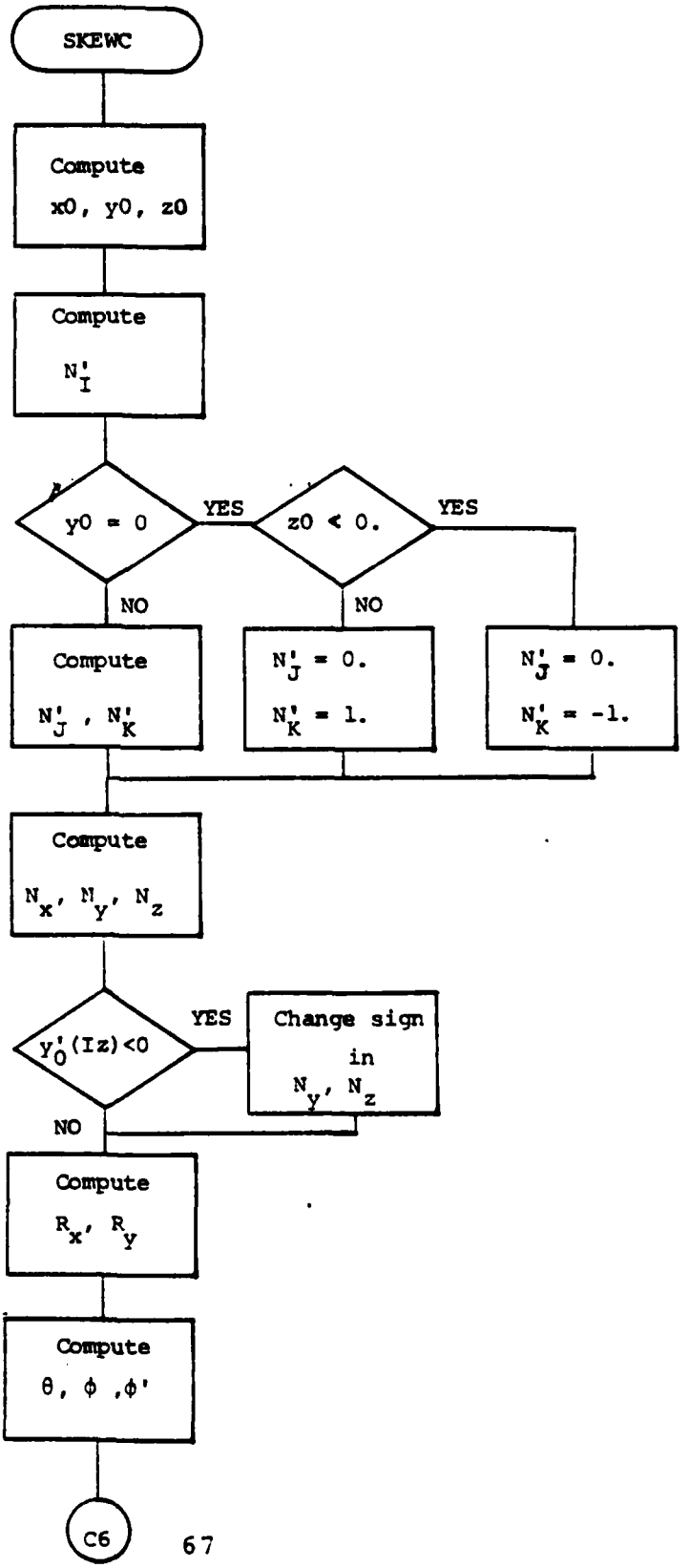

32
N = M
$y_1(N) > z_0'(Iz)$
YES
Return
NO
N = N - 1
N = 0
NO
YES
34
$z_0'(Iz) = 0$
$y_0'(Iz) < 0$
YES
35
NO
change
$y_0'(Iz)$
20

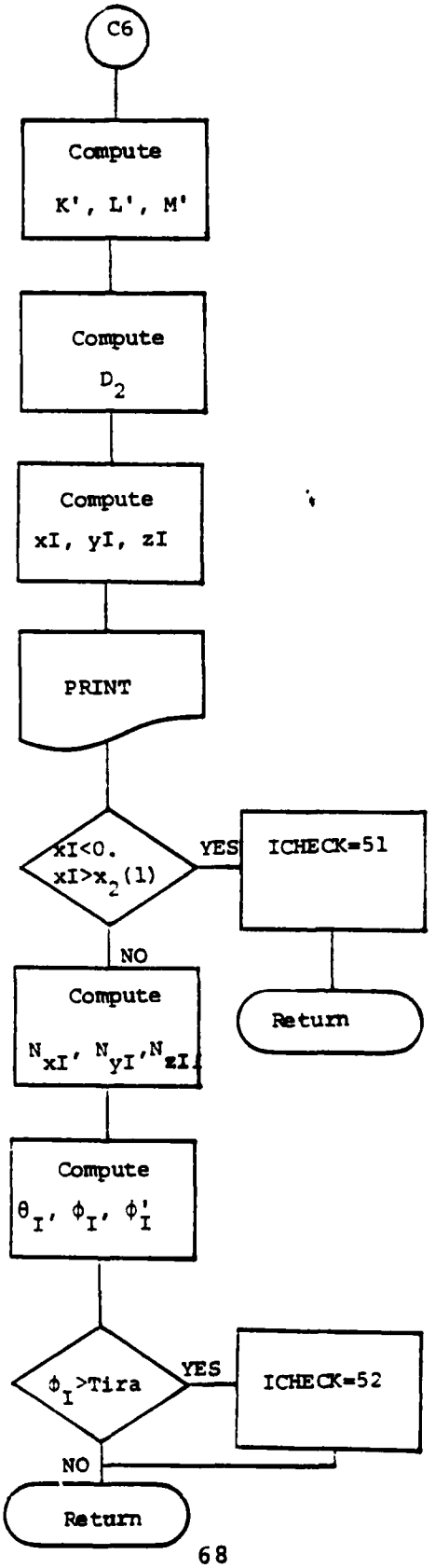

35
change
$y_0'(Iz)$
20

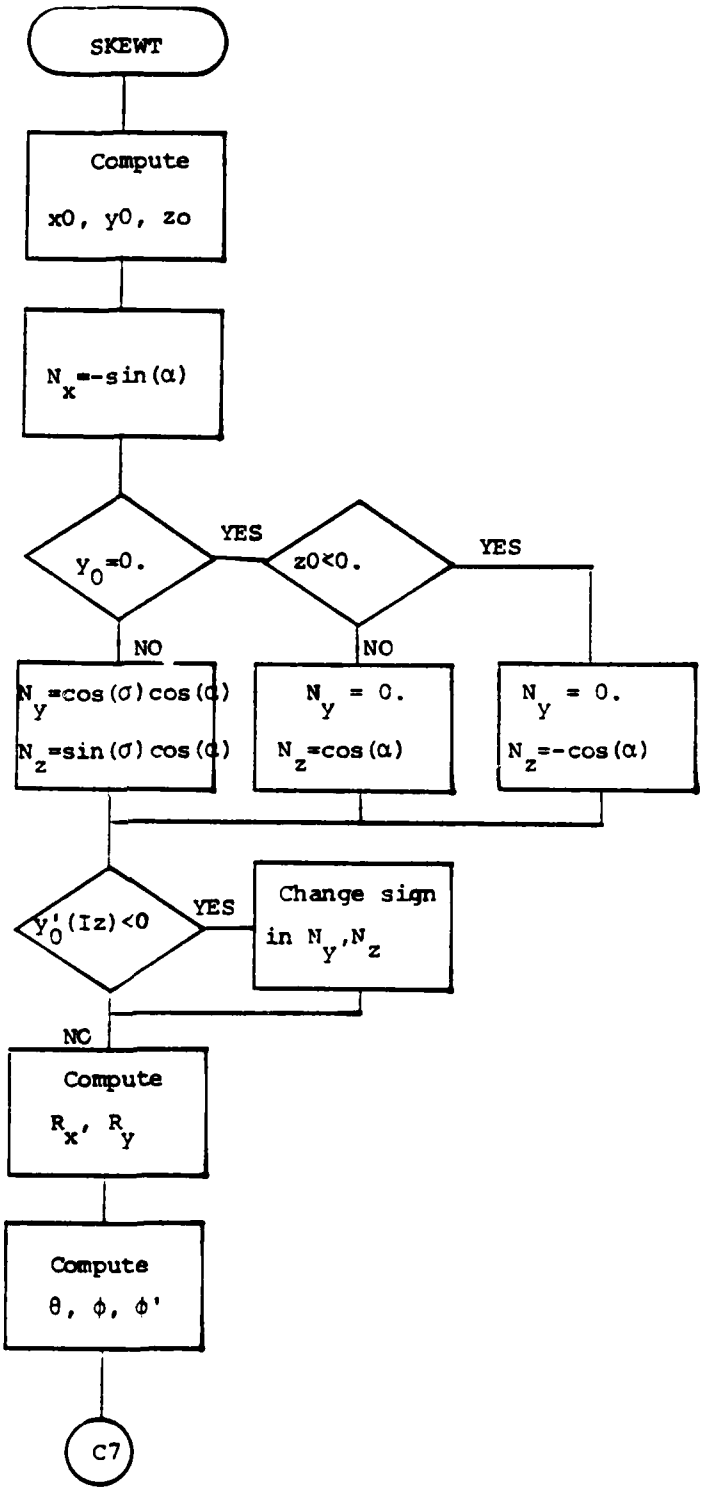

RADI
ICASE=1
YES
NO
$yR_n = y_2(N)$
$yR_1 = y_2(1)$
$yR_n = y_1(N)$
$yR_1 = y_1(1)$
Compute
R = Radius
Compute
R = Radius
$yR_n > R$
YES
ICHECK = 40
NO
Return
$R > yR_1$
YES
NO
N = N - 1
N = N - 1
YES
N > 0
NO
C5

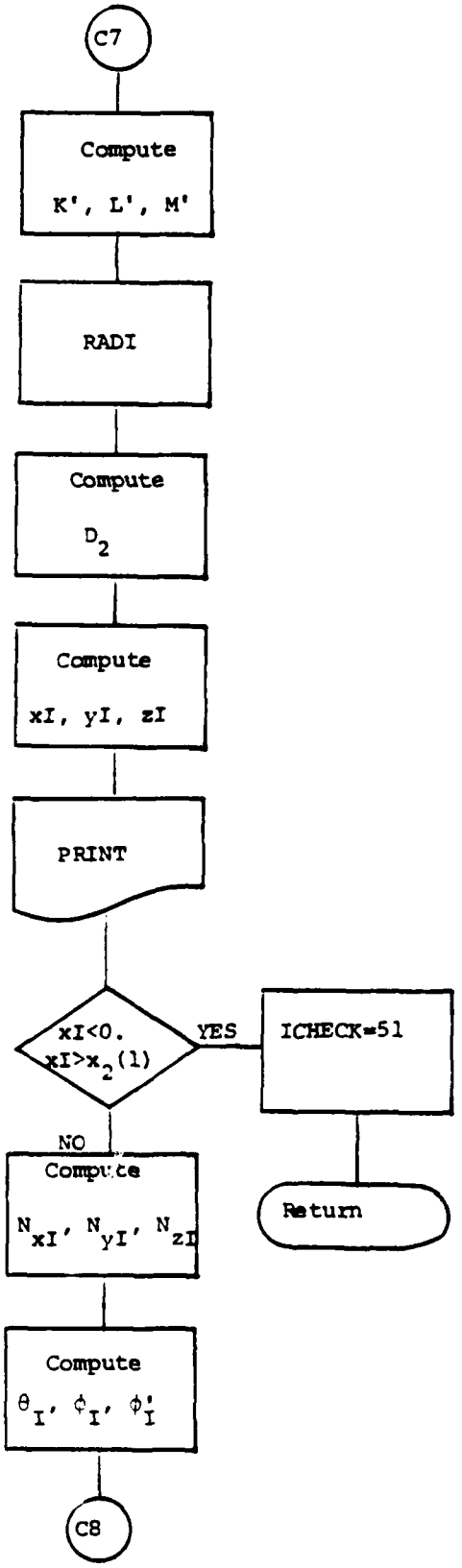

C5
Compute
Cen, Torb
$z'_0(Iz) = 0.$
$y'_0(Iz) \geq 0.$
YES
38
NO
Change
$y'_0(Iz)$
Compute
Bot
$y'_0(Iz) < Bot$
YES
ICHECK=60
NO
ICHECK=20
Return

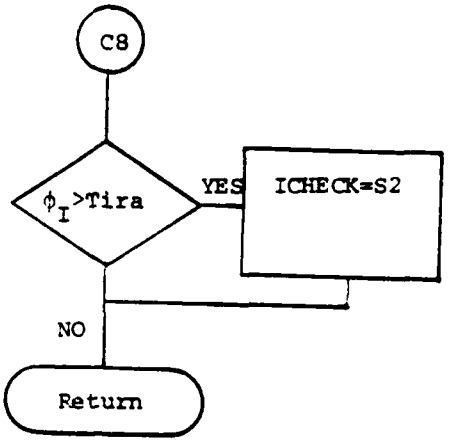

38
Change
$y_0'(Iz)$
Compute
Top
$y_0'(Iz)$
> Top
YES
Change
$y_0'(Iz)$
NO
ICHECK=20
Return

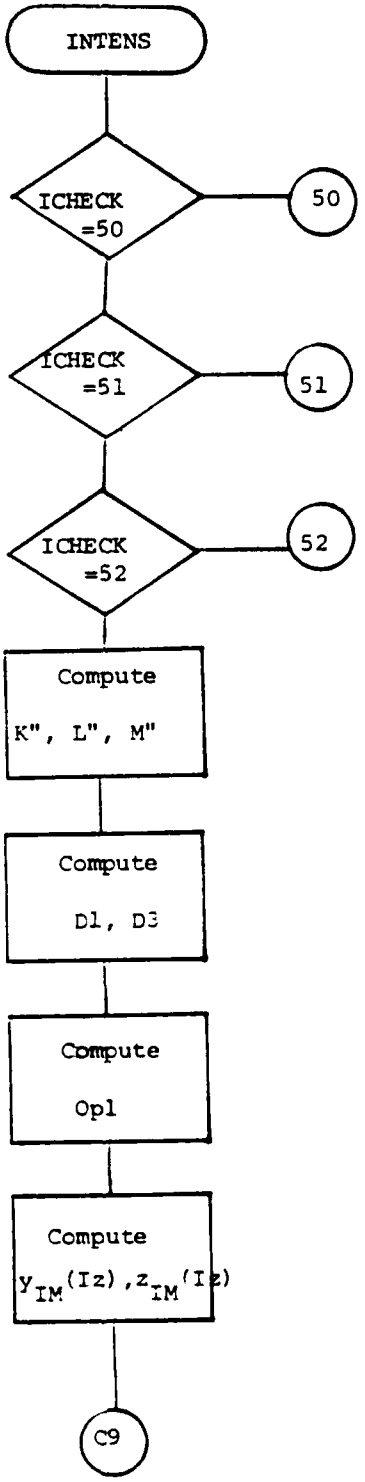

SKEWC
Compute
x0, y0, z0
Compute
N'_I
y0 = 0
YES
z0 < 0.
YES
NO
NO
Compute
N'_J , N'_K
N'_J = 0.
N'_K = 1.
N'_J = 0.
N'_K = -1.
Compute
N_x, N_y, N_z
y'_0(Iz)<0
YES
Change sign
in
N_y, N_z
NO
Compute
R_x, R_y
Compute
θ, ϕ ,ϕ'
C6

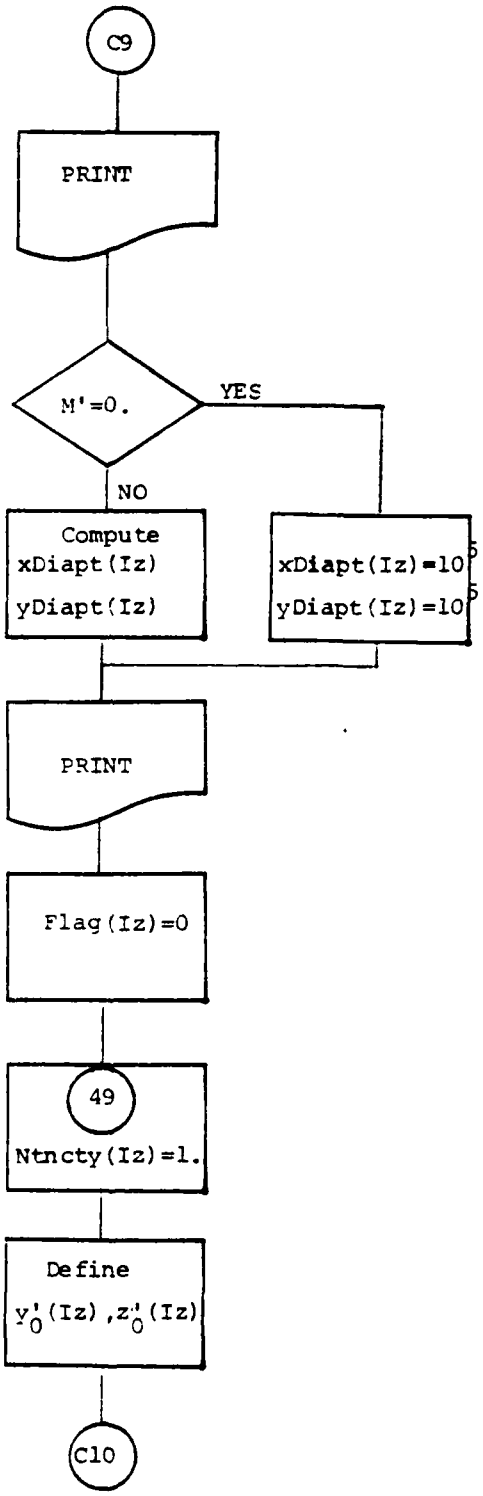

C6
Compute
K', L', M'
Compute
D_2
Compute
xI, yI, zI
PRINT
xI<0.
xI>x_2(1)
YES
ICHECK=51
Return
NO
Compute
N_{xI}, N_{yI}, N_{zI}
Compute
θ_I, ϕ_I, ϕ'_I
ϕ_I>Tira
YES
ICHECK=52
NO
Return

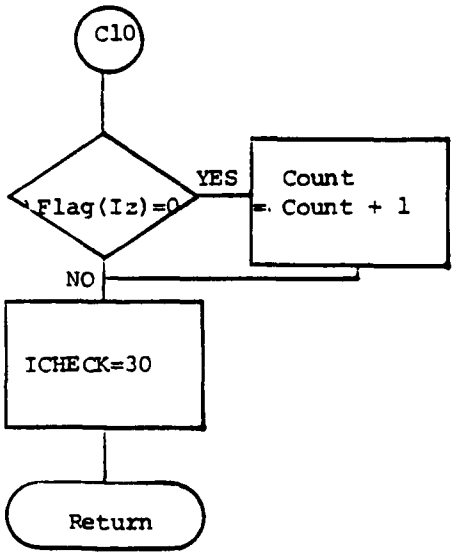

SKEWT
Compute
x0, y0, zo
N_x=-sin(α)
y_0=0.
YES
z0<0.
YES
NO
NO
N_y=cos(σ)cos(α)
N_z=sin(σ)cos(α)
N_y = 0.
N_z=cos(α)
N_y = 0.
N_z=-cos(α)
y_0'(Iz)<0
YES
Change sign
in N_y,N_z
NO
Compute
R_x, R_y
Compute
θ, φ, φ'
C7

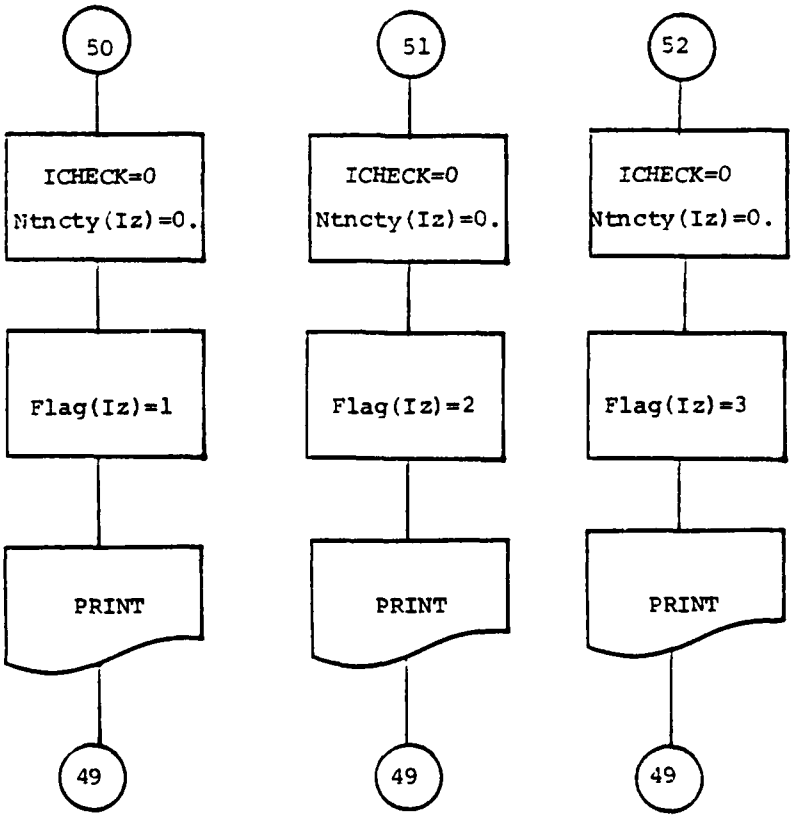

C7
Compute
K', L', M'
RADI
Compute
D_2
Compute
xI, yI, zI
PRINT
xI<0.
xI>x_2(1)
YES
ICHECK=51
Return
NO
Compute
N_{xI}, N_{yI}, N_{zI}
Compute
θ_I, ϕ_I, ϕ'_I
C8


C8
ϕ_I>Tira
YES
ICHECK=S2
NO
Return


INTENS
ICHECK =50
50
ICHECK =51
51
ICHECK =52
52
Compute K", L", M"
Compute D1, D3
Compute Opl
Compute $y_{IM}(Iz), z_{IM}(Iz)$
C9


C9
PRINT
M'=0.
YES
NO
Compute
xDiapt(Iz)
yDiapt(Iz)
xDiapt(Iz)=10^5
yDiapt(Iz)=10^5
PRINT
Flag(Iz)=0
49
Ntncty(Iz)=1.
Define
$y_0'(Iz), z_0'(Iz)$
C10


C10
Flag(Iz)=0
YES
Count
Count + 1
NO
ICHECK=30
Return


50
ICHECK=0
Ntncty(Iz)=0.
Flag(Iz)=1
PRINT
49
51
ICHECK=0
Ntncty(Iz)=0.
Flag(Iz)=2
PRINT
49
52
ICHECK=0
Ntncty(Iz)=0.
Flag(Iz)=3
PRINT
49

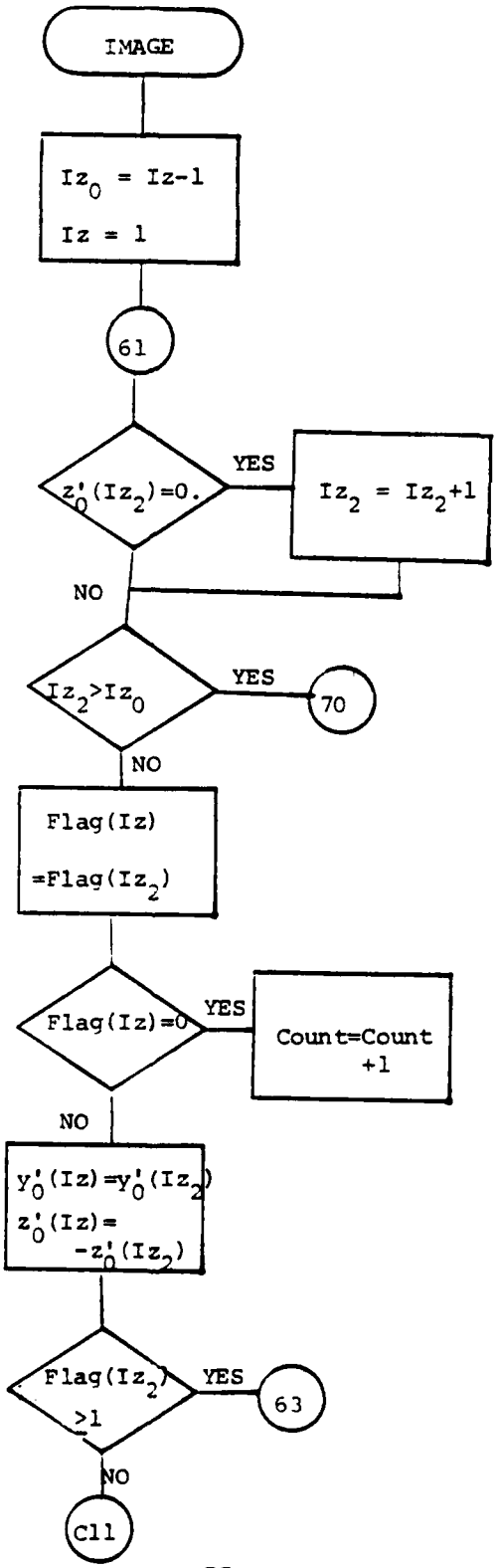
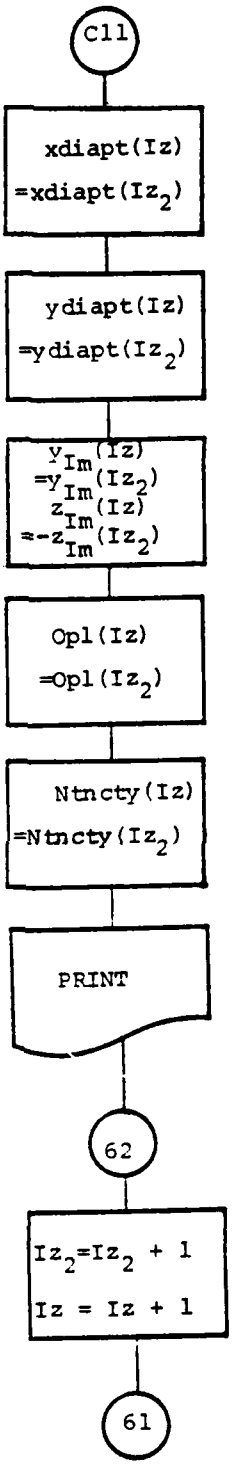
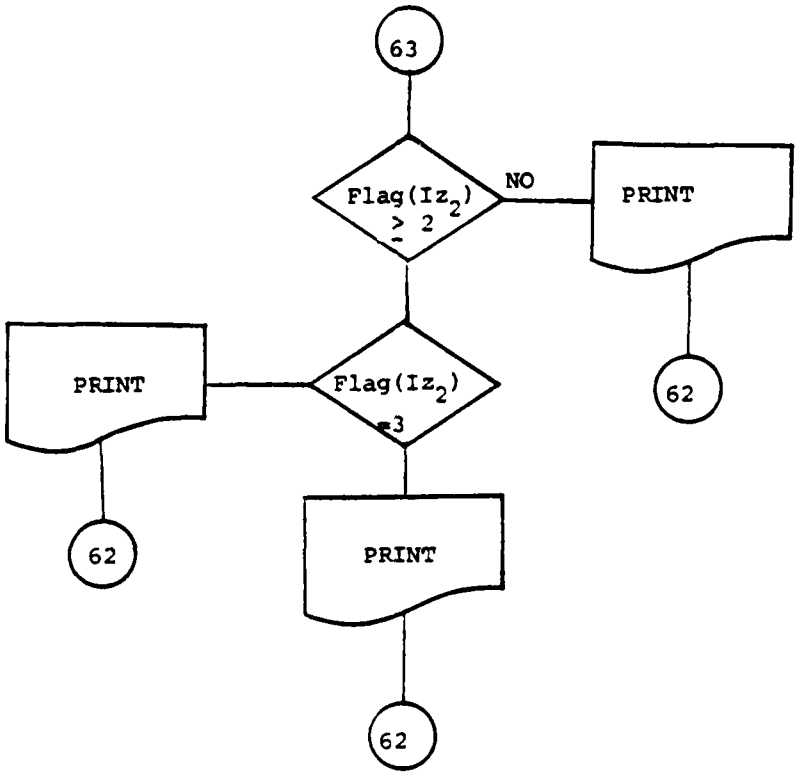
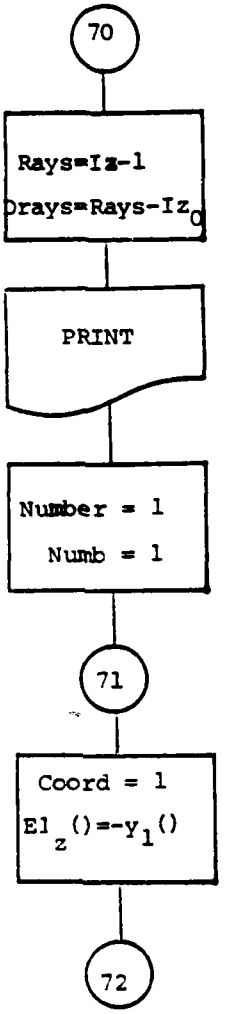
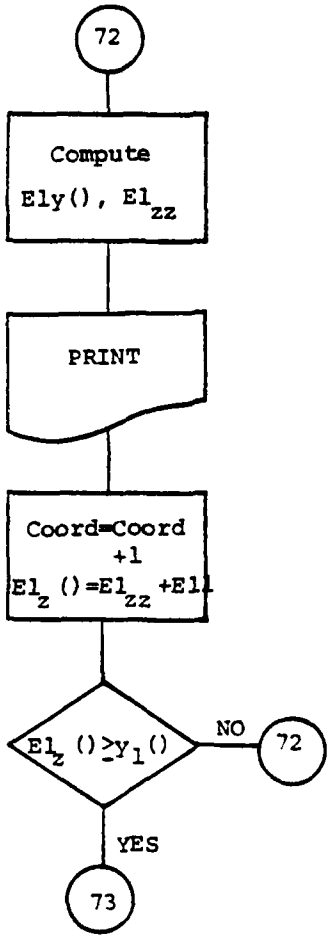


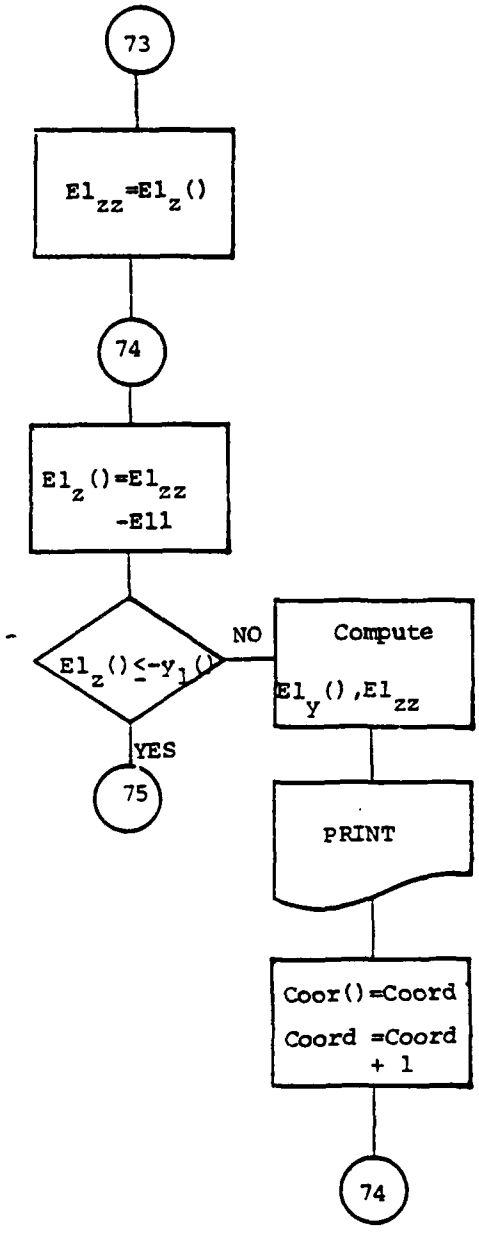
IMAGE
Iz_0 = Iz-1
Iz = 1
61
$z_0'(Iz_2)$=0.
YES
Iz_2 = Iz_2+1
NO
Iz_2>Iz_0
YES
70
NO
Flag(Iz)
=Flag(Iz_2)
Flag(Iz)=0
YES
Count=Count
+1
NO
$y_0'(Iz)=y_0'(Iz_2)$
$z_0'(Iz)=$
$-z_0'(Iz_2)$
Flag(Iz_2)
≥1
YES
63
NO
C11

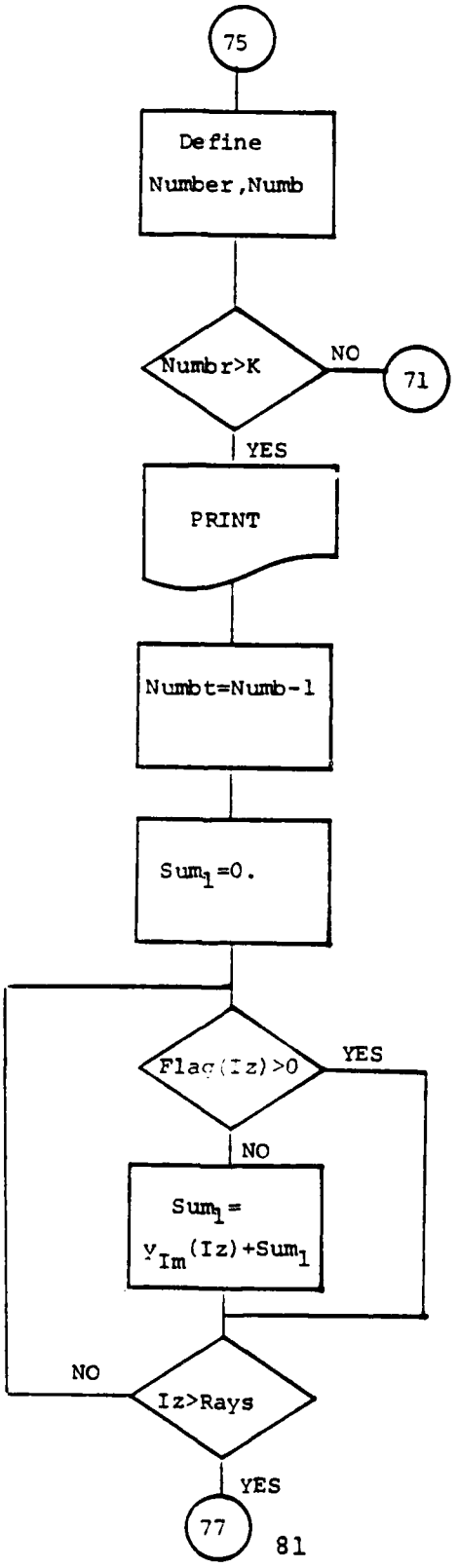

C11
xdiapt(Iz)
=xdiapt(Iz2)
ydiapt(Iz)
=ydiapt(Iz2)
yIm(Iz)
=yIm(Iz2)
zIm(Iz)
=-zIm(Iz2)
Opl(Iz)
=Opl(Iz2)
Ntncty(Iz)
=Ntncty(Iz2)
PRINT
62
Iz2=Iz2 + 1
Iz = Iz + 1
61

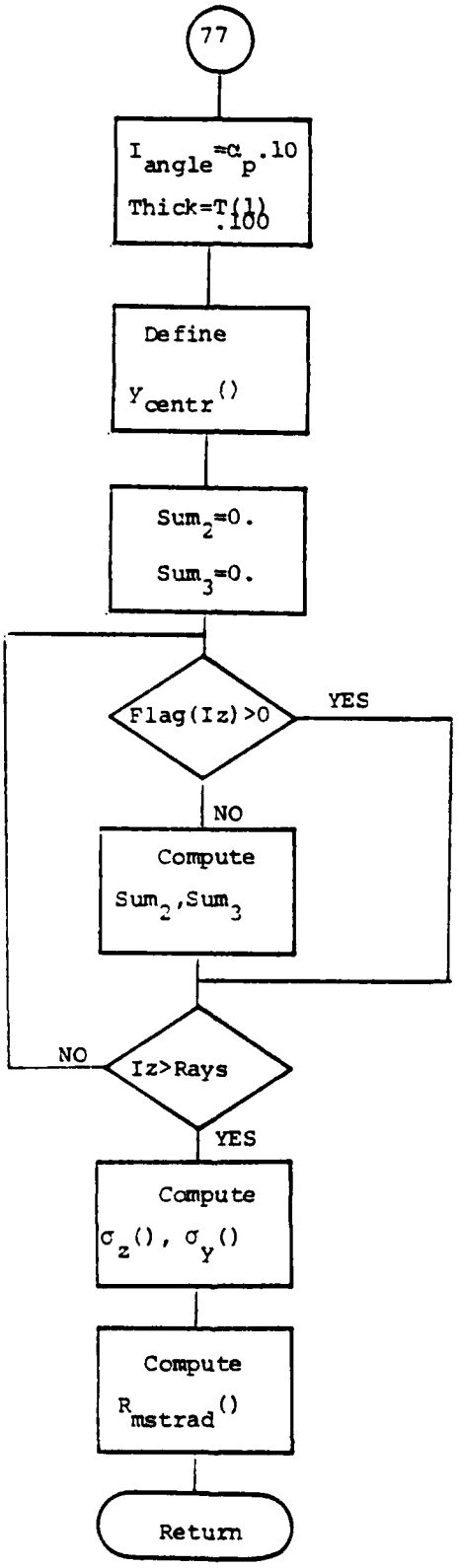

63
Flag(Iz2) ≥ 2
NO
PRINT
62
PRINT
Flag(Iz2) =3
62
PRINT
62

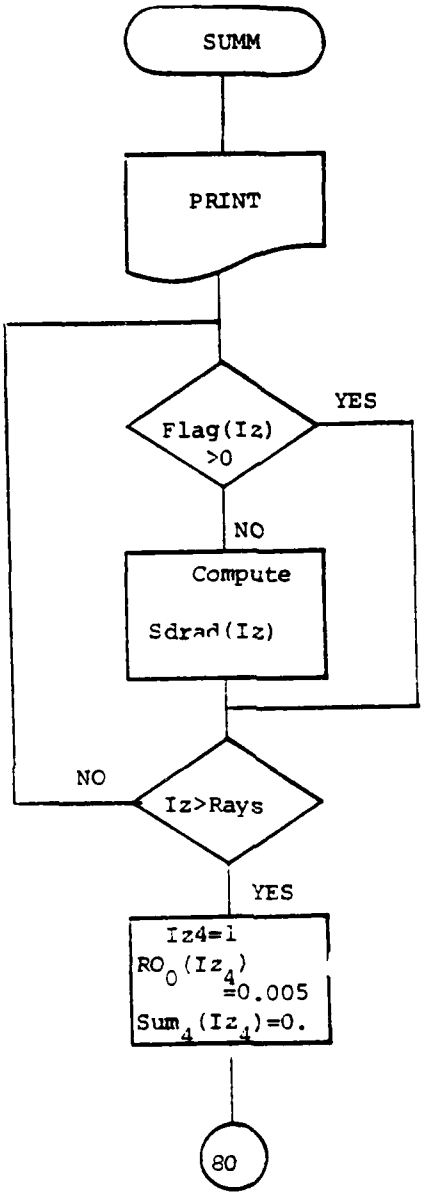

70
Rays=Iz-1
Drays=Rays-Iz0
PRINT
Number = 1
Numb = 1
71
Coord = 1
El z()=-y1()
72

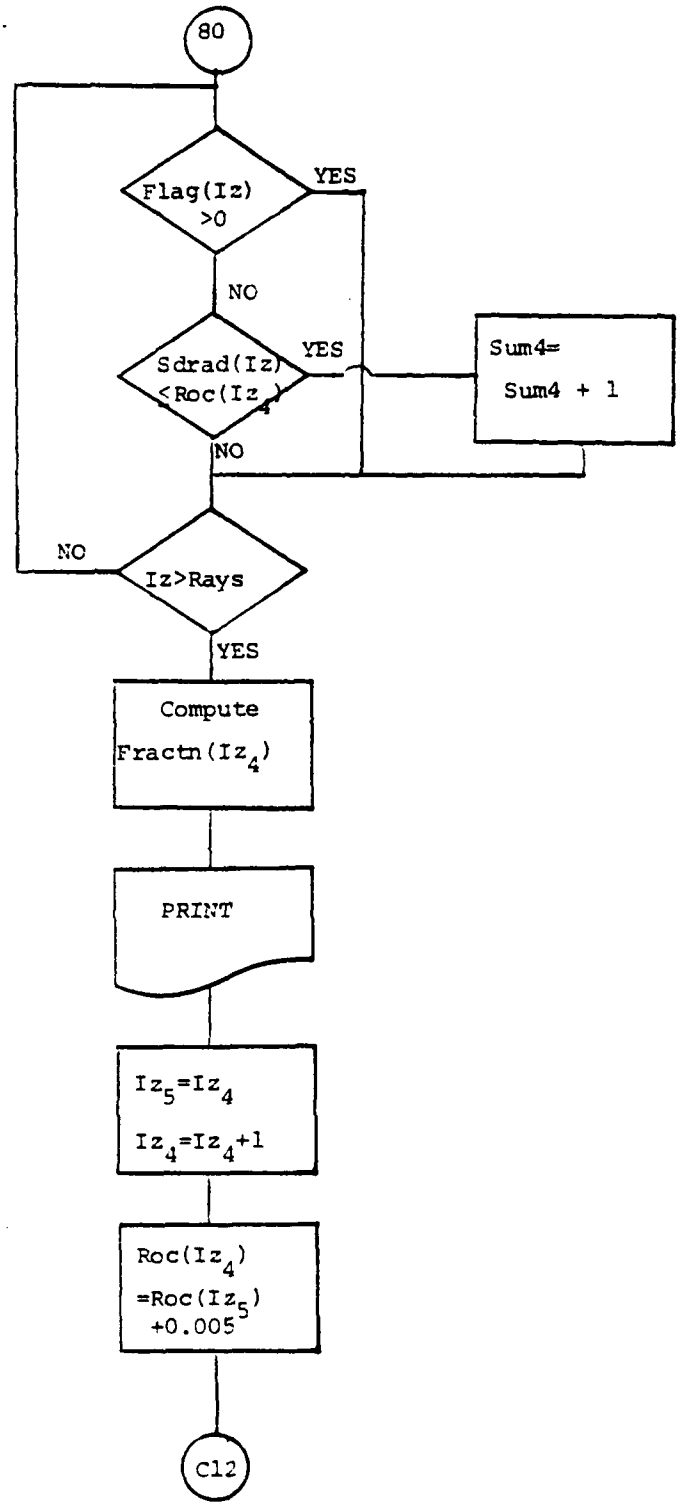

72
Compute
Ely(), El$_{zz}$
PRINT
Coord=Coord
+1
El$_z$ ()=El$_{zz}$ +El
El$_z$ ()≥y$_1$()
NO
72
YES
73

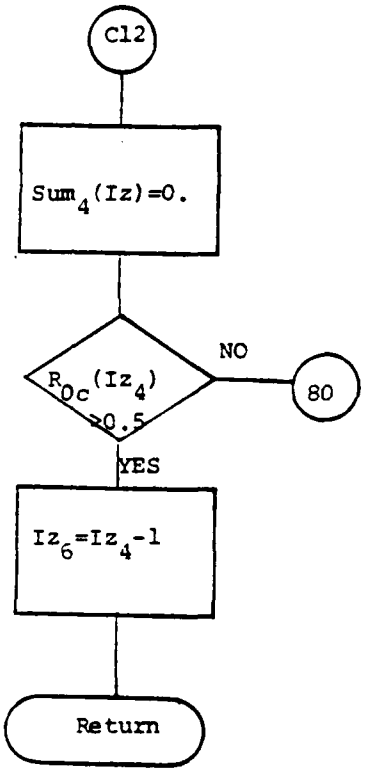

73
$El_{zz}=El_z()$
74
$El_z()=El_{zz}$
-El1
$El_z() \leq -y_1()$
NO
Compute
$El_y(), El_{zz}$
YES
75
PRINT
Coor()=Coord
Coord =Coord
+ 1
74

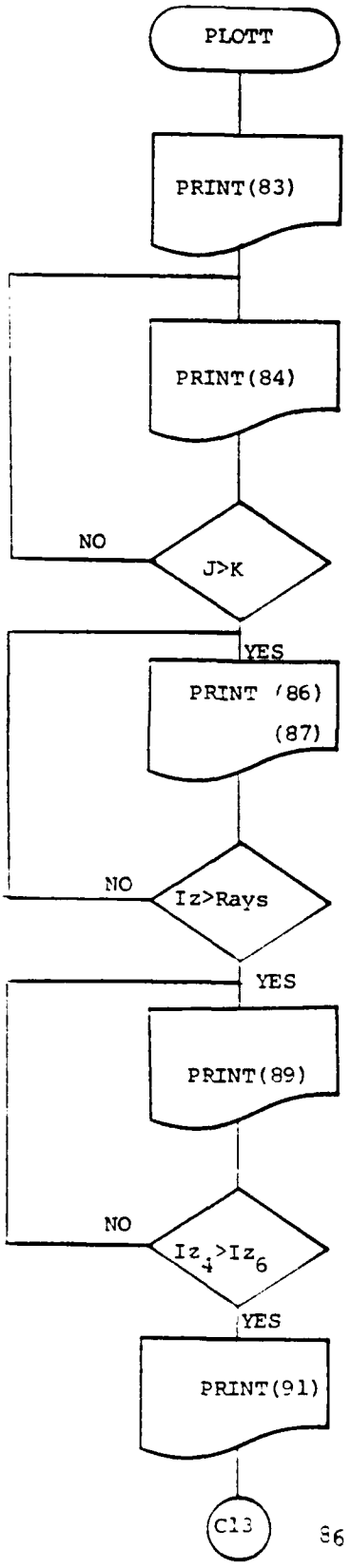

75
Define
Number,Numb
Numbr>K
NO
71
YES
PRINT
Numbt=Numb-1
Sum1=0.
Flag(Iz)>0
YES
NO
Sum1 =
YIm(Iz)+Sum1
NO
Iz>Rays
YES
77

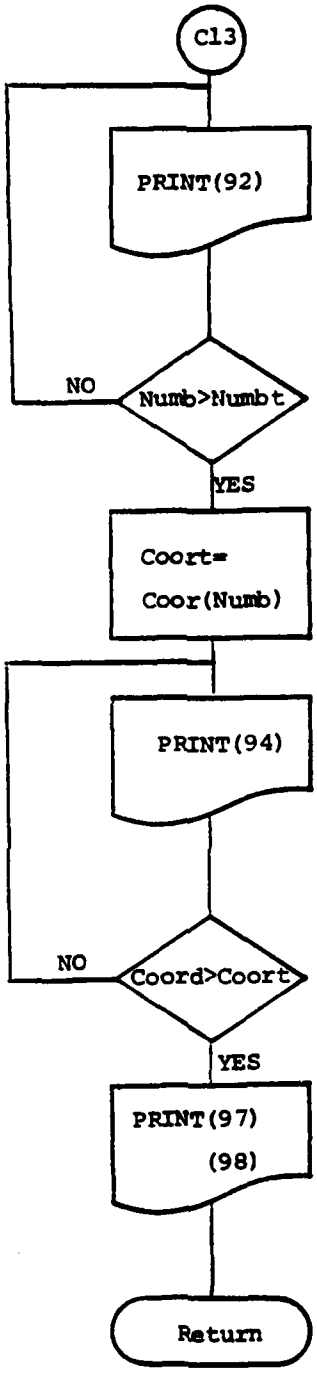

77
$I_{angle}=\alpha_p.10$
Thick=T(1).100
Define
$Y_{centr}()$
$Sum_2=0.$
$Sum_3=0.$
Flag(Iz)>0
YES
NO
Compute
Sum_2, Sum_3
Iz>Rays
NO
YES
Compute
$\sigma_z(), \sigma_y()$
Compute
$R_{mstrad}()$
Return


SUMM
PRINT
Flag(Iz)
>0
YES
NO
Compute
Sdrad(Iz)
NO
Iz>Rays
YES
Iz4=1
RO0(Iz4)
=0.005
Sum4(Iz4)=0.
80


80
Flag(Iz) >0
YES
NO
Sdrad(Iz) <Roc(Iz4)
YES
Sum4= Sum4 + 1
NO
Iz>Rays
NO
YES
Compute Fractn(Iz4)
PRINT
Iz5=Iz4
Iz4=Iz4+1
Roc(Iz4) =Roc(Iz5) +0.005
C12


Cl2
Sum4(Iz)=0.
R0c(Iz4)
>0.5
NO
80
YES
Iz6=Iz4-1
Return


PLOTT
PRINT(83)
PRINT(84)
NO
J>K
YES
PRINT '86)
(87)
NO
Iz>Rays
YES
PRINT(89)
NO
$Iz_4 > Iz_6$
YES
PRINT(91)
C13

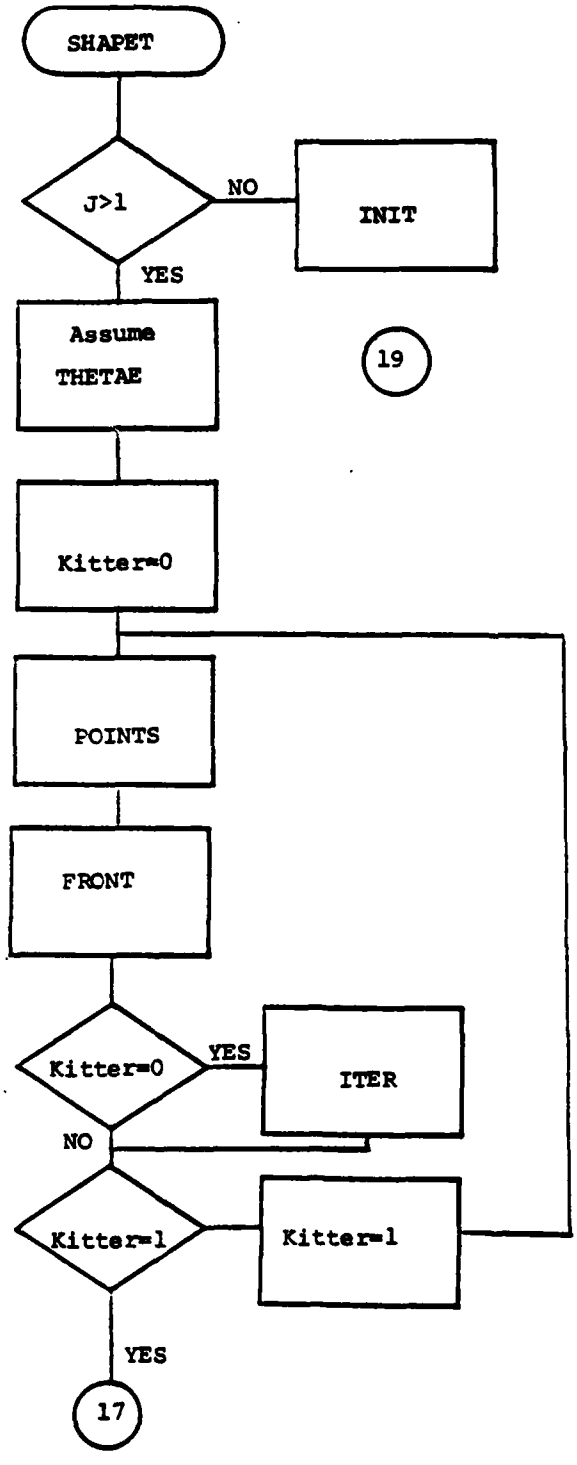

C13
PRINT(92)
NO
Numb>Numbt
YES
Coort=
Coor(Numb)
PRINT(94)
NO
Coord>Coort
YES
PRINT(97)
(98)
Return

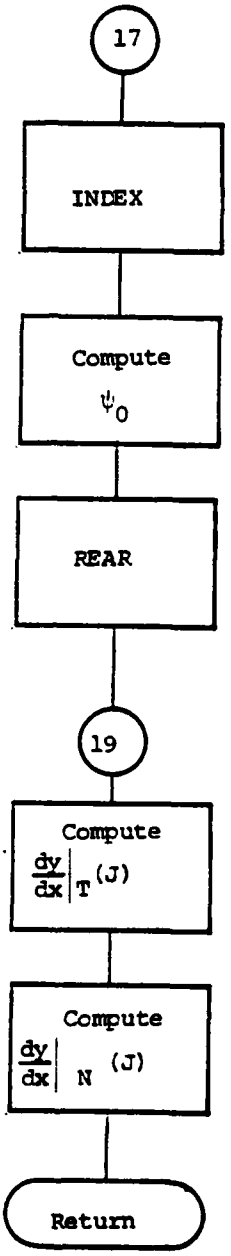
6. FLOW CHART OF PROGRAM GRIN

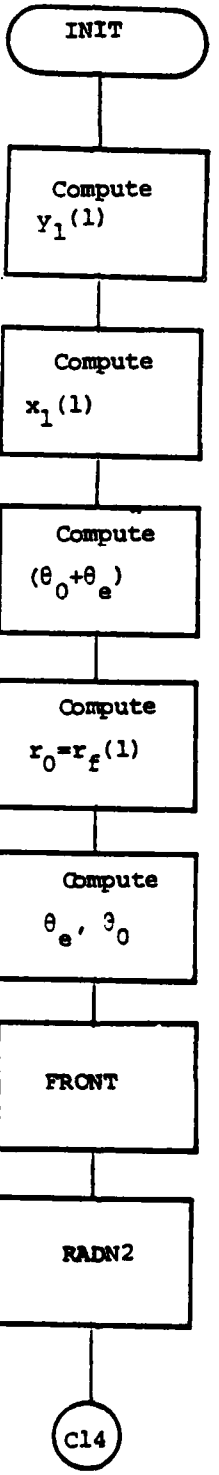
Note: Program GRIN is identical to program LENS (Section 5) except for subroutines:

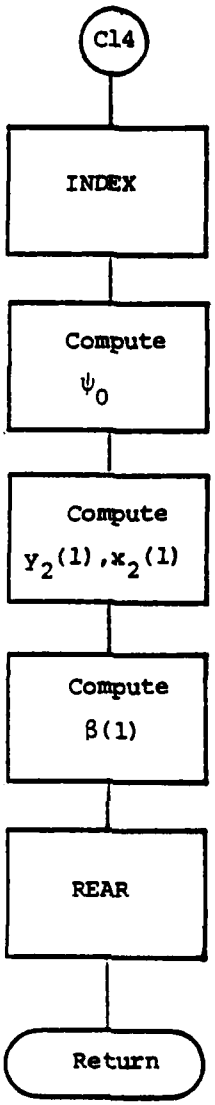
SHAPET, SKEWT, SHAPEC, SKEWC.

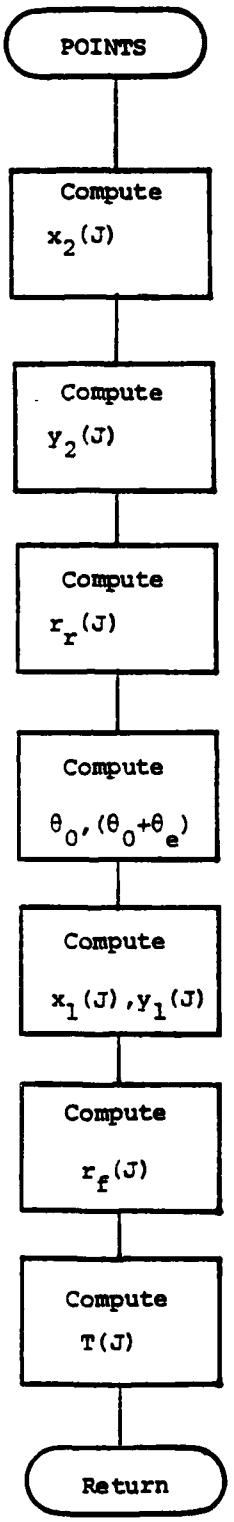
The flow chart for the first two is listed below. Subroutines SHAPEC, SKEWC are of a different design (fixed cone α_p for the rear surface). They are part of Captain Carr's thesis [15], and they will be described there.

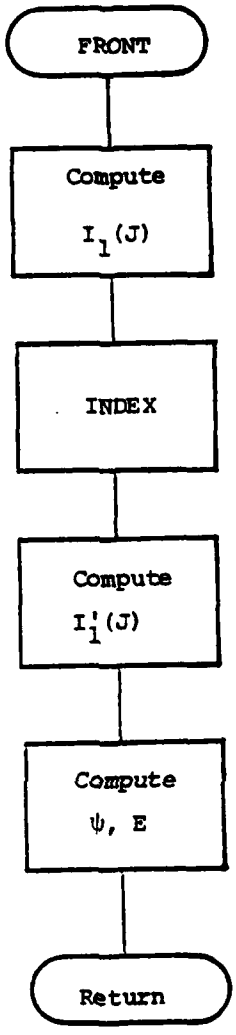

SHAPET
J>1
NO
INIT
YES
Assume
THETAE
19
Kitter=0
POINTS
FRONT
Kitter=0
YES
ITER
NO
Kitter=1
Kitter=1
YES
17

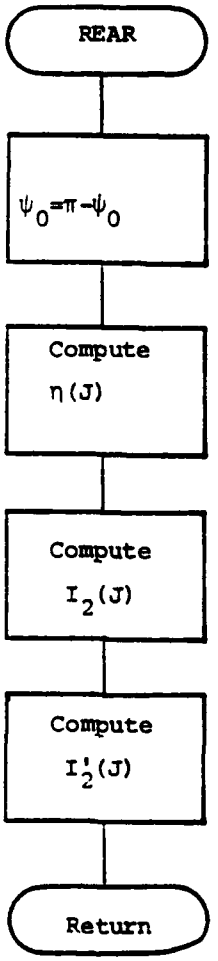

17
INDEX
Compute
ψ_0
REAR
19
Compute
$\left.\frac{dy}{dx}\right|_T (J)$
Compute
$\left.\frac{dy}{dx}\right|_N (J)$
Return

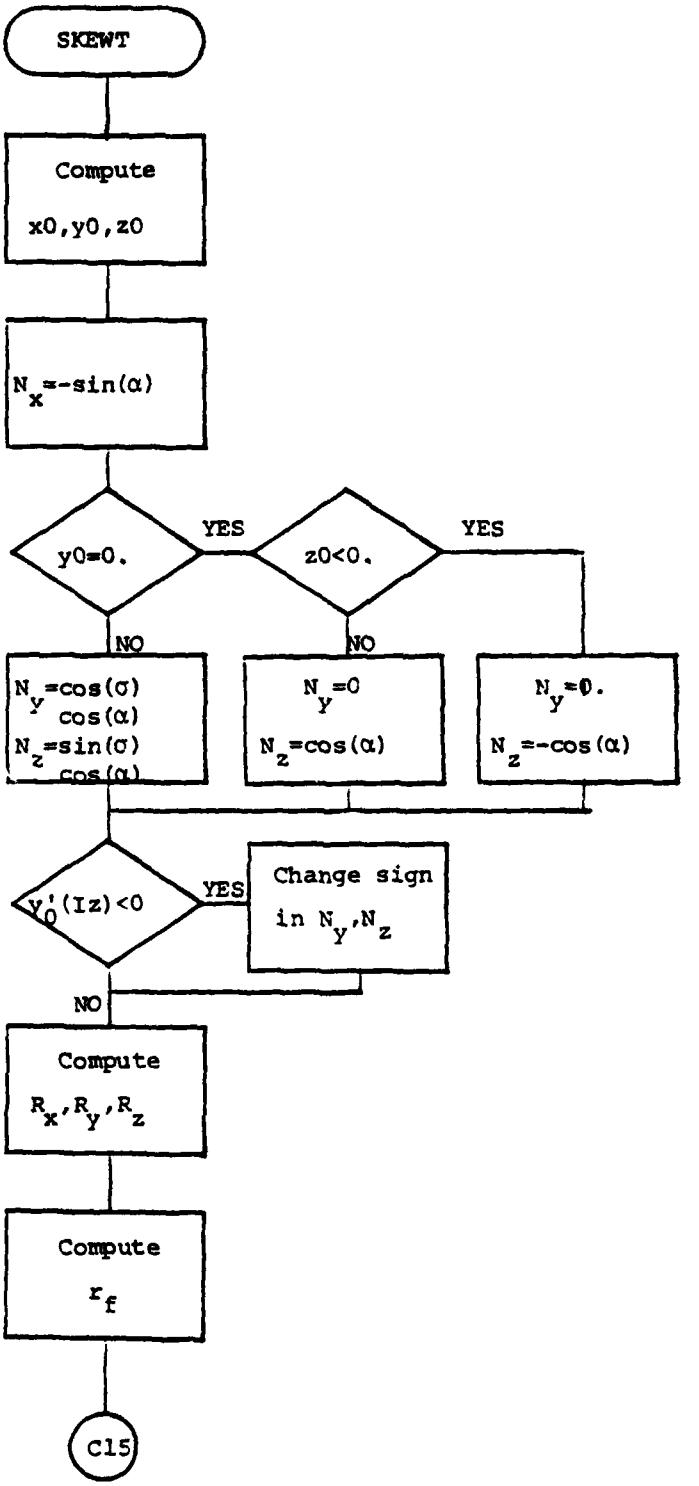

INIT
Compute $y_1(1)$
Compute $x_1(1)$
Compute $(\theta_0+\theta_e)$
Compute $r_0=r_f(1)$
Compute θ_e, ϑ_0
FRONT
RADN2
C14

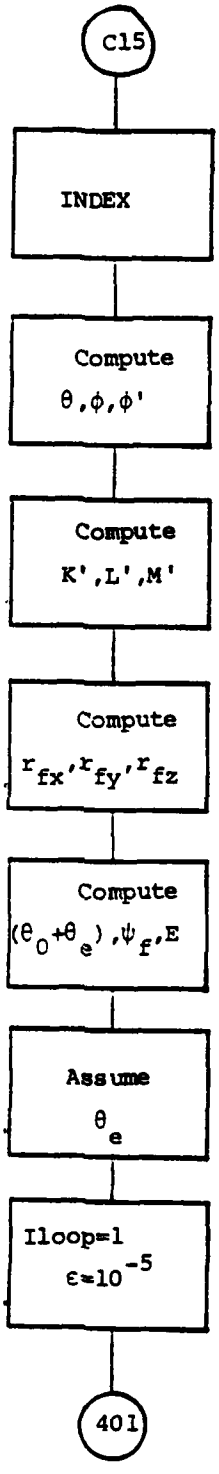

C14
INDEX
Compute
ψ_0
Compute
$y_2(1), x_2(1)$
Compute
$\beta(1)$
REAR
Return

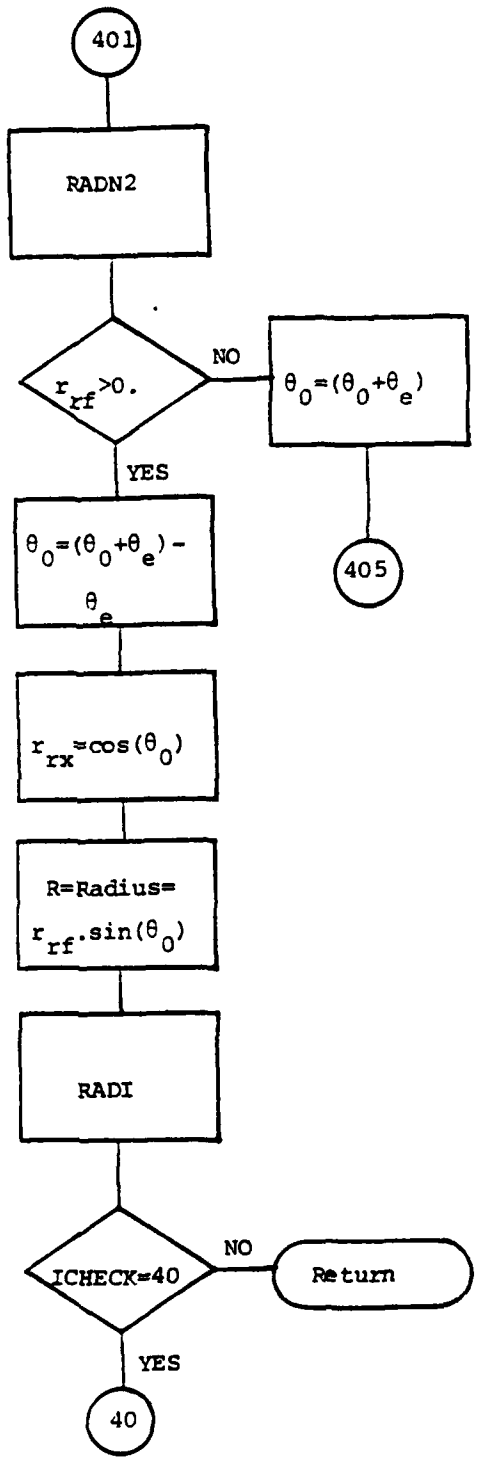

POINTS
Compute $x_2(J)$
Compute $y_2(J)$
Compute $r_r(J)$
Compute $\theta_0, (\theta_0+\theta_e)$
Compute $x_1(J), y_1(J)$
Compute $r_f(J)$
Compute T(J)
Return

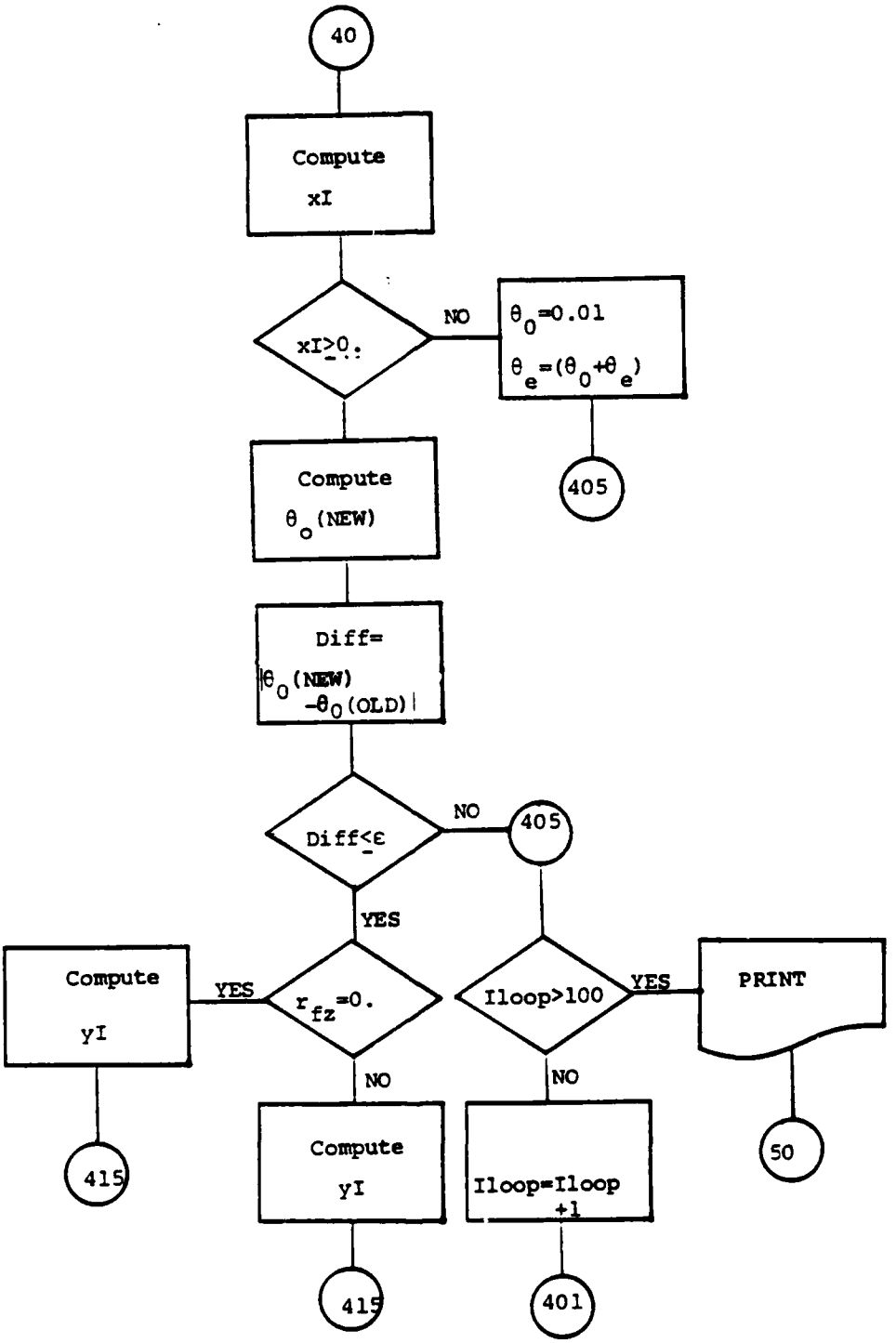

FRONT
Compute
$I_1(J)$
INDEX
Compute
$I_1'(J)$
Compute
ψ, E
Return

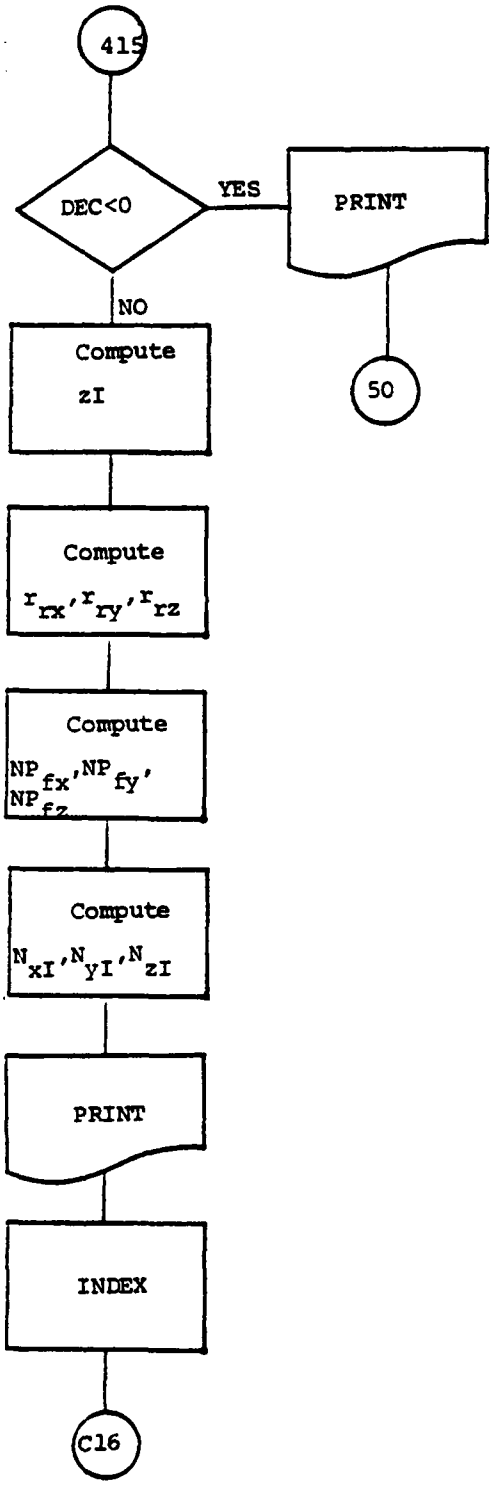

REAR
$\psi_0 = \pi - \psi_0$
Compute
$\eta(J)$
Compute
$I_2(J)$
Compute
$I_2'(J)$
Return

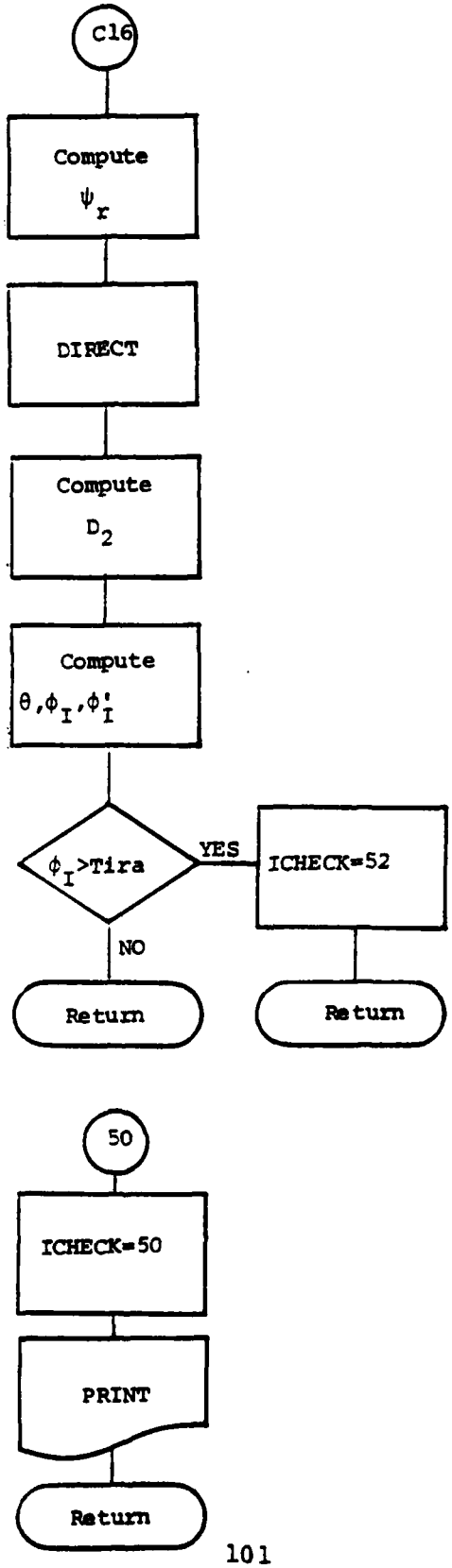

SKEWT
Compute
x0,y0,z0
N_x=-sin(α)
y0=0.
YES
z0<0.
YES
NO
NO
N_y=cos(σ) cos(α)
N_z=sin(σ) cos(α)
N_y=0
N_z=cos(α)
N_y=0.
N_z=-cos(α)
y_0'(Iz)<0
YES
Change sign in N_y,N_z
NO
Compute
R_x,R_y,R_z
Compute
r_f
C15

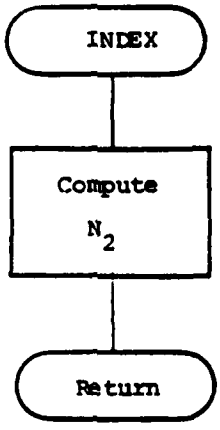

C15
INDEX
Compute
θ,ϕ,ϕ'
Compute
K',L',M'
Compute
r_{fx}, r_{fy}, r_{fz}
Compute
$(\theta_0+\theta_e), \psi_f, E$
Assume
θ_e
Iloop=1
$\epsilon=10^{-5}$
401

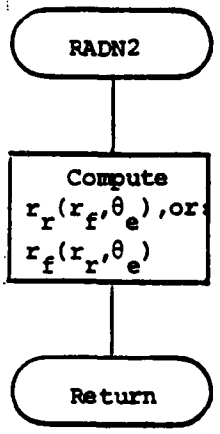

401
RADN2
$r_{rf}>0.$
NO
$\theta_0=(\theta_0+\theta_e)$
YES
405
$\theta_0=(\theta_0+\theta_e)-\theta_e$
$r_{rx}=\cos(\theta_0)$
R=Radius=
$r_{rf}.\sin(\theta_0)$
RADI
ICHECK=40
NO
Return
YES
40

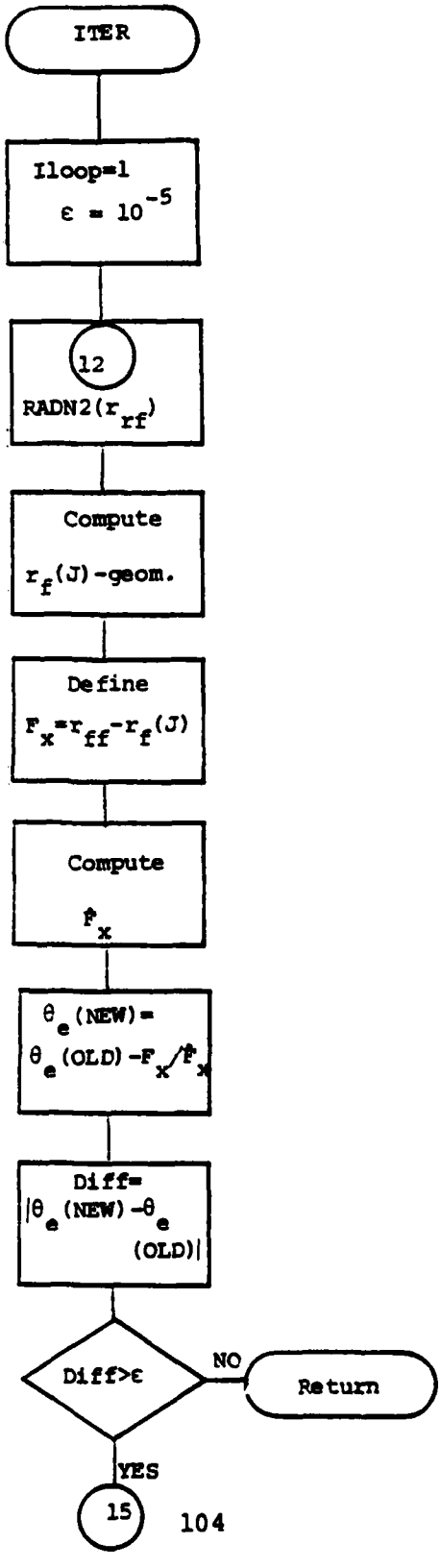

40
Compute xI
xI≥0.
NO
θ0=0.01
θe=(θ0+θe)
405
Compute θo(NEW)
Diff= |θ0(NEW) -θ0(OLD)|
Diff≤ε
NO
405
YES
Compute yI
YES
rfz=0.
Iloop>100
YES
PRINT
NO
NO
Compute yI
Iloop=Iloop +1
415
415
401
50

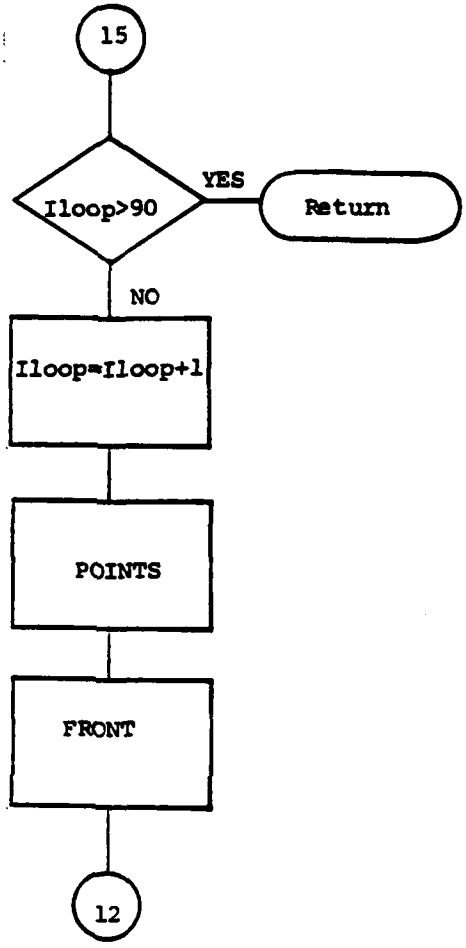

415
DEC<0
YES
PRINT
NO
Compute
zI
50
Compute
r_{rx}, r_{ry}, r_{rz}
Compute
$NP_{fx}, NP_{fy}, NP_{fz}$
Compute
N_{xI}, N_{yI}, N_{zI}
PRINT
INDEX
C16

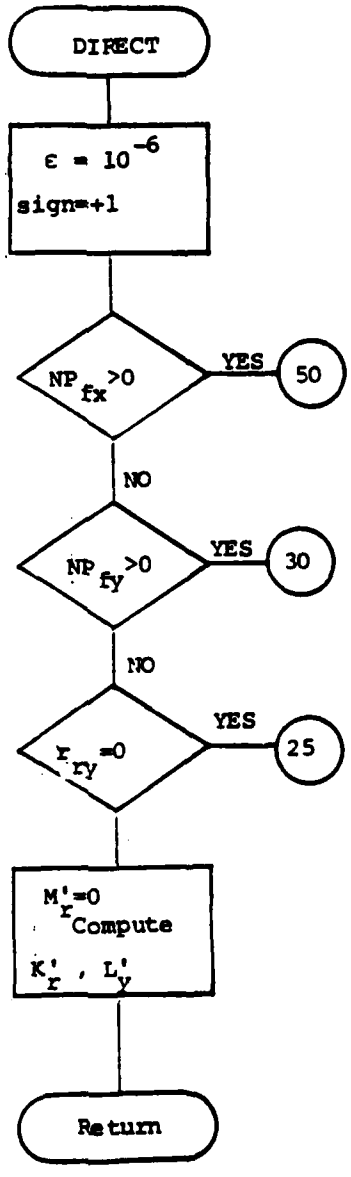

C16
Compute ψ_r
DIRECT
Compute D_2
Compute θ, ϕ_I, ϕ'_I
ϕ_I>Tira
YES
ICHECK=52
NO
Return
Return
50
ICHECK=50
PRINT
Return

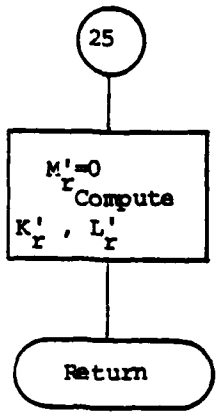

INDEX
Compute
N_2
Return

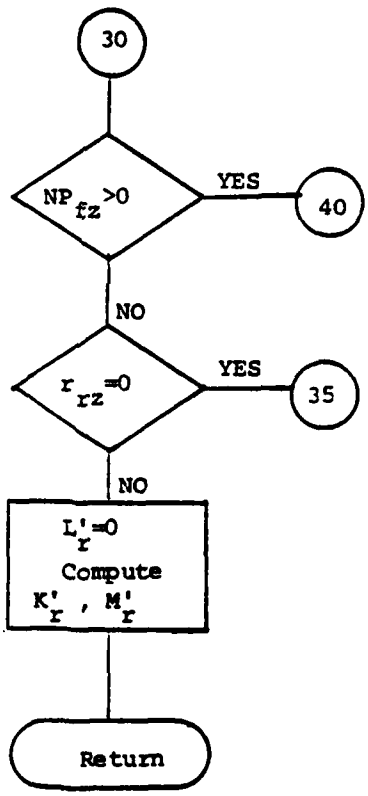

RADN2
Compute
$r_r(r_f,\theta_e)$,or
$r_f(r_r,\theta_e)$
Return

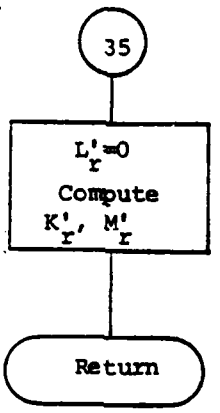

ITER
Iloop=1
ε = 10^-5
12
RADN2(r_rf)
Compute
r_f(J)-geom.
Define
F_x=r_ff-r_f(J)
Compute
f'_x
θ_e(NEW)=
θ_e(OLD)-F_x/f'_x
Diff=
|θ_e(NEW)-θ_e
(OLD)|
Diff>ε
NO
Return
YES
15

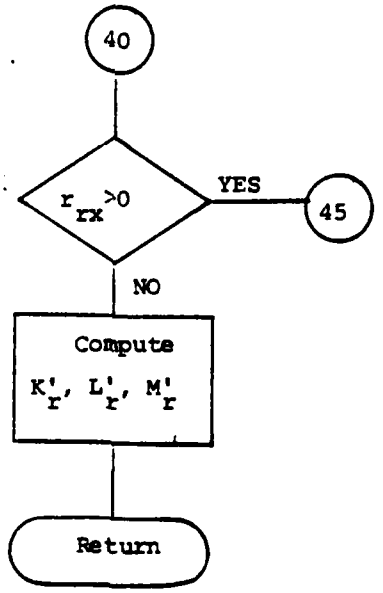

15
Iloop>90
YES
Return
NO
Iloop=Iloop+1
POINTS
FRONT
12

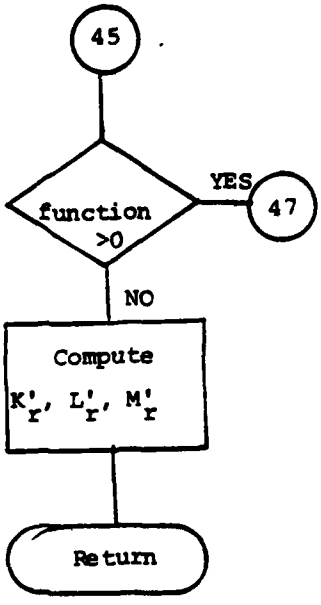

DIRECT
ε = 10^-6
sign=+1
NP_fx>0
YES
50
NO
NP_fy>0
YES
30
NO
r_ry=0
YES
25
M'_r=0
Compute
K'_r , L'_y
Return

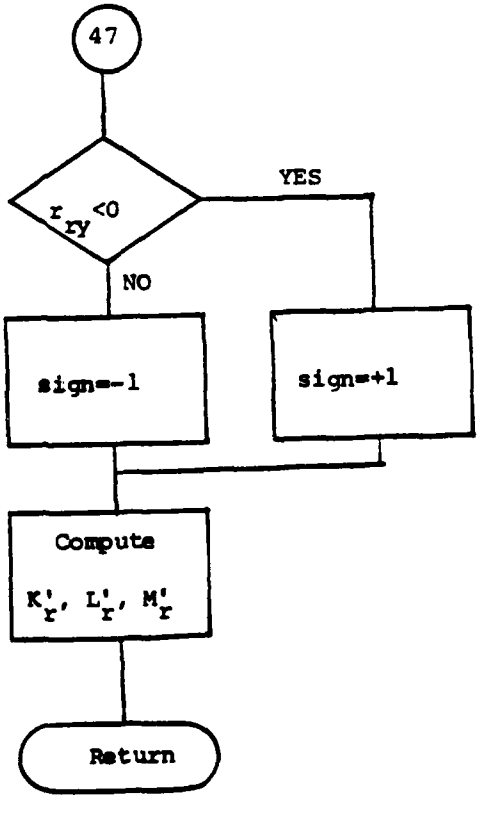

25
M'_r=0
Compute
K'_r , L'_r
Return

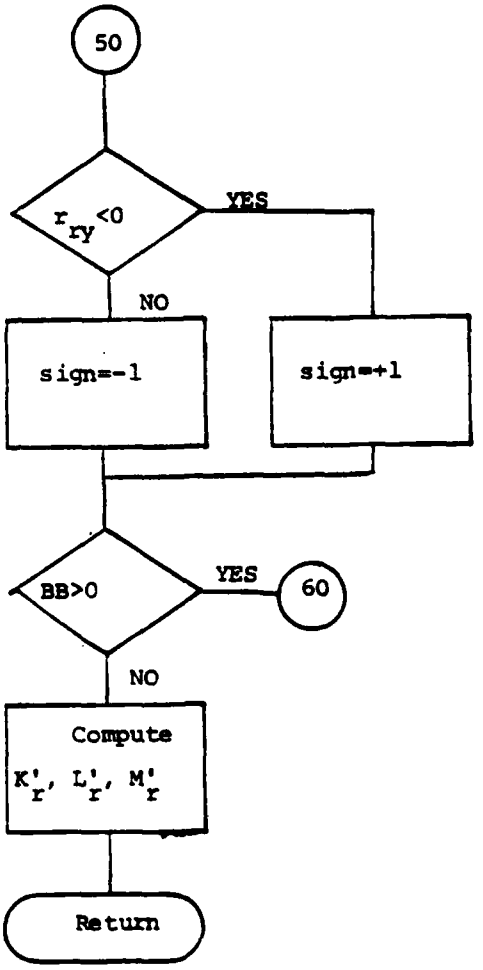

30
NP_{fz}>0
YES
40
NO
τ_{rz}=0
YES
35
NO
L'_r=0
Compute
K'_r , M'_r
Return

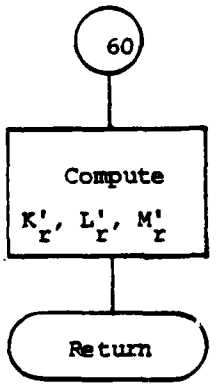

35
$L'_r=0$
Compute
K'_r, M'_r
Return


40
$r_{rx}>0$
YES
45
NO
Compute
K'_r, L'_r, M'_r
Return


45
function >0
YES
47
NO
Compute
K'_r, L'_r, M'_r
Return


47
r_{xy}<0
YES
NO
sign=-1
sign=+1
Compute
K'_r, L'_r, M'_r
Return


50
r_{ry}<0
YES
NO
sign=-1
sign=+1
BB>0
YES
60
NO
Compute
K'_r, L'_r, M'_r
Return


60
Compute
K'_r, L'_r, M'_r
Return

7. COMPUTER PROGRAMS USER'S GUIDE

7.1 Input Data

F, α, U, I_{case}

I, R, T(1)

N_1, N_2, N_3

α_p, Grid, Ellnum

X_C, Div

Shape, Squray, Ellips

7.2 Options

I_{case}=1 Rear surface is a fixed cone
(Capt. Carr's thesis, see ref. [15])

I_{case}=2 Front surface is a fixed cone
(This report).

7.3 Execution Commands

7.3.1 Opening Commands

LΔXXXX (Write account no. instead of XXXX).

Password

GLOBAL TXTLIB FORTMOD2 MOD2EEH

7.3.2 Compilation

FORTGI LENS (or GRIN)

7.3.3 Run on Terminal (WORKG(1))

FILEDEF 05 DISK DATA L

FILEDEF 06 DISK OUT D (RECFM F BLOCK 132 PERM

EXEC RUN LENS (or GRIN)

XEDIT OUT D

7.3.4 Hard Copy

FILE

PRINT OUT D

7.3.5 Get a Plot

LENSCOM PRINTER

7.3.6 Change in Plot Routine

XEDIT LENSPLOT FORTRAN

7.3.7 Transfer Files to Another User

(a) **The Transferer**

CP SPOOL PUNCH CONT TO XXXXP(2)

PUNCH LENS FORTRAN(3)

(PUNCH GRIN FORTRAN(3))

(PUNCH DATA L(3))

CP SPOOL PUNCH CLOSE NOCONT

CP SPOOL PUNCH OFF

(b) The Receiver

READCARDΔ*Δ*

(c) Notes

(1) WORKG is the name of the file of the commands in this section.

(2) Account No. of the receiver.

(3) Optional.

8. COMPUTER PROGRAMS LIST OF SYMBOLS AND SUBROUTINES

8.1 Subroutines

DATTA	Initial data
SHAPET	Computes shape of lens in $I_{case}=2$
SHAPEC	Computes shape of lens in $I_{case}=1$
INIT	Computes behavior of first ray.
POINTS	Computes coordinates of rear and front surfaces.
FRONT	Computes $I_1(J)$, $I_1'(J)$, ψ, E at front surface.
REAR	Computes $\eta(J)$, $I_2(J)$, $I_2'(J)$ at rear surface.
CALTC	Computes thickness at each point for SHAPEC.
NOSE	Computes extrapolation of last points in $I_{case}=1$, or coordinates shift in $I_{case}=2$.
ZOYO	Computes $Z_0'(IZ)$, $y_0'(IZ)$ for skew rays calculation.
RADI	Computes intersection of the ray with the designed surface.
SKEWT	Skew rays calculation in $I_{case}=2$.
SKEWC	Skew rays calculation in $I_{case}=1$.
INTENS	Calculates transmitted intensity of the rays.
IMAGE	Calculates image plane spot diagram.
SUMM	Calculates spot diagram energy density.
PLOTT	Save output for plot routine.
INDEX	Computes index of refraction in the lens (N_2).
RADN2	Computes radius to rear (or front) surface from known radius to front (or rear) surface and θ_e.
ITER	Iteration routine to find correct θ_e in SHAPET.
DIRECT	Computes direction cosines of the ray at the rear surface.

8.2 Program Symbols

8.2.1 Data Symbols

F	Focal length.
α	The fixed surface cone half angle.
U	The incident ray offset angle.
I	Number of iterations.
R	Maximum radius of fixed surface cone.
T(1)	Thickness of lens at the edge.
N_1, N_2, N_3	Indices of refraction.
α_p	Inclination of object plane.
Grid	Size of grid increment.
Ellnum	Number of ellipses.
Ell	z - coordinate increment for ellipse plot.
X_C	Location of center symmetry in GRIN.
Div	The maximum change in the index of refraction (N_2)

8.2.2 Geometrical Symbols

$x_1(J), y_1(J)$	Coordinates on front surface.
$x_2(J), y_2(J)$	Coordinates on rear surface.
$r_f(J)$	Radius to front surface.
$r_r(J)$	Radius to rear surface.
XO, YO, ZO	Intercept of the ray with the front surface.
XI, YI, ZI	Intercept of the ray with the rear surface.
Y_{Im}, Z_{Im}	Intersection with the image plane.

8.2.3 Direction Cosines Symbols

N_x, N_y, N_z	Direction cosines of the front surface normal.

N_{xI}, N_{yI}, N_{zI}	Direction cosines of the rear surface normal.
R_x, R_y, R_z	Direction of cosines of the ray.
K', L', M'	Direction cosines of the internal refracted ray.
r_{fx}, r_{fy}, r_{fz}	Direction cosines of the front radius.
$NP_{fx}, NP_{fy}, NP_{fz}$	Direction cosines of the normal to plane of the ray at front surface.
r_{rx}, r_{ry}, r_{rz}	Direction cosines of the rear radius.
K", L", M"	Direction cosines of the rear surface external refracted ray.

8.2.4 Angle Symbols

The angle symbols are defined in figures 3 and 8.

9. PROGRAM LENS - LISTING

```
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C                                                                      C
C                          PROGRAM LENS                                C
C                                                                      C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      COMMON/D1/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF
     1,ALFAP,GFID,ELLALF,FNUM,ELLBF,PI,RAD,ICASE
     2,SHAPE,SOURAY,ELLIPS,ICHECK
      COMMON/SFP/I1(1010),I1P(1010),I2(1010),I2P(1010)
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)
      COMMON/SP/K,L,IZ,IZ1,M,N,NP1,FLAG(1000),IZO,RAYS,IZ2,DRAYS
     1,NUMBR,COORD,NUMP,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6
     2,CCOR(500),NUMET,COORT,GAMMA,AB,ONP,STATNA
     3,RAYY(1000),RAYZ(1000),CENT,TORBT,BOTT,TOPT
     4,RADIUS,CEN,TOP,BOT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA
     6,NPI,NPJ,NPK,THETA,PHI,PHIP,AO,BO,CO,OC,FC,PAR1,PAR2
     7,PAR3,XO,YO,ZO,NUP,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,X1,Y1,Z1
     8,NUM5,CKPP,CLPP,CMPP,D3,CPL(1000),DL,NUM6,NUM7,NTNCTY(1000)
     9,YIM(1000),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO
      COMMON/SP/NUMP,THETAI,XDIAPT(1000),YDIAPT(1000),SUM1
     1,SUM2,SUM3,SIGPAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)
     2,RCC(3000),SUM4(3000),FRACTN(3000),SDRAD(1000),YCENTR(20,500)
C
      INTEGER ELLNUM,ENUM,SHAPE,SOURAY,ELLIPS
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT
      REAL N1,N2,N3
      REAL I1,I1P,I2,I2P
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA
      REAL NPI,NPJ,NPK,NUP,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8
     1,NTNCTY
C
      CALL DATIA
      ICHECK=0
      K=I+1
      DO 10 J=1,K
      IF(J.GT.1)BETA(J)=BETA(1)-(J-1)*DLB
      IF(ICASE.EQ.1)CALL SHAPEC
      IF(ICASE.EQ.2)CALL SHAPET
      IF(J.GT.1)GO TO 5
      DLB=BETA(1)/I
      WRITE(6,100) ICASE,ALPHA,BETA(1),R,U,I,T(1),N1,N2,N3,BF,DLB
    5   IF(SHAPE.EQ.0)GO TO 10
        WRITE(6,200)J,X1(J),Y1(J),X2(J),Y2(J),BETA(J),I2P(J),I2(J),
     1  ETA(J),T(J),I1P(J),I1(J),DYDXT(J)
   10 CONTINUE
        CALL NOSE
   20 CALL ZOYO
        IF(ICASE.GT.1)GO TO 25
        CALL RACI
        IF(ICHECK.EQ.20)GO TO 20
        IF(ICHECK.EQ.40)CALL SKEWC
        IF(ICHECK.EQ.60)GO TO 60
        GO TO 50
   25 CALL SKEWT
        IF(ICHECK.EQ.20)GO TO 20
        IF(ICHECK.EQ.60)GO TO 60
   50 CALL INTENS
        IF(ICHECK.EQ.30)GO TO 20
        STOP
   60 CALL IMAGE
      CALL SUMP
      CALL PLOT1
  100 FORMAT('1','GLP LENS PARAMETERS(',I1,')'///5X,'ALPHA = ',F9.7,2X,
     1'BETA = ',F9.7,2X,'RADIUS = ',F7.5,2X,'INCIDENT ANGLE = ',
     1F9.6,2X,'ITERATIONS = ',I5//5X,'EDGE THICKNESS = ',F9.7,2X,
     1'INDICES OF REFRACTION: N1 = ',F7.5,2X,'N2 = ',F7.5,2X,'N3 = ',
     1F7.5//5X,'FOCAL LENGTH FROM STATION ZERO = ',F7.5,2X,
     1'DELTA BETA= ',F7.5///
     11X,'  J        X1         Y1          X2          Y2         BETA        I2P
     1       I2         ETA        E0          I1P         I1        DYDXT'//)
```

```
  200 FORMAT(1),I4,12F10.7)                                                  LEN00730
      STOP                                                                   LEN00740
      END                                                                    LEN00750
                                                                             LEN00760
      SUBROUTINE DATTA                                                       LEN00770
      COMMON/DAT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF                LEN00780
     1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                             LEN00790
     2,SHAPE,SCURAY,ELLIPS,ICHECK                                            LEN00800
      COMMON/SHF/I1(1010),I1P(1010),I2(1010),I2P(1010)                       LEN00810
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                         LEN00820
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                                    LEN00830
      COMMON/SHK/K,L,IZ,IZ1,M,N,NP1,FLAG(1000),IZ0,RAYS,IZ2,CRAYS            LEN00840
     1,ALMBR,CCORD,NUMB,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                       LEN00850
     2,CCCR(500),NUMBT,COORT,GAMMA,AB,ONP,STATNA                             LEN00860
     3,RAYY(1000),RAYZ(1000),CENI,TCRBI,BOTI,TOPI                            LEN00870
     4,RADIUS,CEN,TCP,ECT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP              LEN00880
     5,AX,NY,AZ,RX,RY,RZ,AXI,NYI,NZI,PHII,PHIIP,TIRA                         LEN00890
     6,APT,NPJ,APK,THETA,PHI,PHIP,A0,B0,C0,DC,E0,PAR1,PAR2                   LEN00900
     7,PAR3,XC,YC,ZC,NLP,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI         LEN00910
     8,NUM5,CKPP,CLPP,CMPP,D3,GPL(1000),D1,NUM6,NUM7,NTNCTY(1000)            LEN00920
     9,YIM(1000),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZDYD             LEN00930
      COMMON/SH/NUMB,THETAI,XD(APT(1000),YD(APT(1000),SUM1                   LEN00940
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)                LEN00950
     2,RCC(370),SUM4(370),FRACTN(300),SORAD(1000),YCENTR(20,500)             LEN00960
C                                                                            LEN00970
      INTEGER ELLNUM,ENUM,SHAPE,SCURAY,ELLIPS                                LEN00980
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT                   LEN00990
      REAL N1,N2,N3                                                          LEN01000
      REAL I1,I1P,I2,I2P                                                     LEN01010
     1,AX,NY,AZ,RX,RY,RZ,AXI,NYI,NZI,PHII,PHIIP,TIRA                         LEN01020
      REAL NPJ,APJ,APK,AUP,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8           LEN01030
     1,NTNCTY                                                                LEN01040
C                                                                            LEN01050
CCCCC F IS THE FOCAL LENGTH                                                  LEN01060
CCCCC ALPHA IS THE INSIDE SURFACE CONE HALF ANGLE                            LEN01070
CCCCC    (ALFA IS IN DEG.,ALPHA IS IN RAD.)                                  LEN01080
CCCCC U IS THE INCIDENT RAY OFFSET ANGLE                                     LEN01090
CCCCC ICASE CHOOSES WHETHER THE CONE IS THE FRONT SURFACE(I,ICASE=1)         LEN01100
CCCCC                              OR THE REAR SURFACE(C,ICASE=2)            LEN01110
CCCCC I IS THE NUMBER OF ITERATIONS(MUST BE AN EVEN INTEGER)                 LEN01120
CCCCC R IS THE MAXIMUM RADIUS OF INSIDE SURFACE CONE                         LEN01130
CCCCC T IS THE THICKNESS OF LENS AT THE EDGE                                 LEN01140
C       (E0 IS THE APPELIZED T)                                              LEN01150
C     N1,N2,N3 ARE THE INDICES OF REFRACTIONS                                LEN01160
      READ (5,*) F,ALFA,U,ICASE                                              LEN01170
      READ (5,*) I,R,T(1)                                                    LEN01180
      READ (5,*) N1,N2,N3                                                    LEN01190
      T(1)=T(1)/R                                                            LEN01200
      PI=ATAN(1.0)*4.0                                                       LEN01210
      RAD=PI/180.0                                                           LEN01220
      ALPHA=ALFA*RAD                                                         LEN01230
C                                                                            LEN01240
CCCCC INPUT KNOWNS FOR TRACE RAY:                                            LEN01250
CCCCC ALFAP IS THE INCLINATION OF OBJECT PLANE(RADIANS)                      LEN01260
CCCCC GRID IS THE SIZE OF GRID INCREMENT                                     LEN01270
CCCCC ELLNUM :  THE NUMBER OF ELLIPSES=ENUM;ELLNUM MUST BE EVEN              LEN01280
CCCCC              AND 1/ELLNUM MUST BE AN INTEGER WITH NO REMAINDER         LEN01290
C     ELL IS THE Z COORDINATE INCREMENT FOR ELLIPSE PLOTS                    LEN01300
      READ (5,*) ALFAP,GRID,ELLNUM                                           LEN01310
      ENUM=ELLNUM+1                                                          LEN01320
      ELL=GRID/5.0                                                           LEN01330
      BF=F/R                                                                 LEN01340
C                                                                            LEN01350
C     INPUT FOR GRID(NOT IN USE HERE)                                        LEN01360
      READ(5,*)XC,DIV                                                        LEN01370
C                                                                            LEN01380
CCCCC OUTPUT OPTIONS:                                                        LEN01390
CCCCC TO HAVE LENS SHAPE DATA PRINTED SET "SHAPE" TO 1. OTHERWISE            LEN01400
CCCCC SET "SHAPE"=0                                                          LEN01410
CCCCC TO HAVE SKEW RAY AND MIRROR IMAGE SKEW RAY DATA OUTPUT SET             LEN01420
CCCCC "SCURAY" TO 1. ELSE SET "SCURAY" TO 0. (INTEGER)                       LEN01430
C     TO HAVE ELLIPSE SHAPE DATA PRINTED SET "ELLIPS" TO 1. OTHERWISE        LEN01440
```

```
C     SET "ELLIPS" = C                                                  LENC1450
      READ (5,*) SHAPE,SQURAY,ELLIPS                                    LENC1460
      RETURN                                                            LENC1470
      END                                                               LENC1480
                                                                        LENC1490
      SUBROUTINE SHAPE1                                                 LENC1500
      COMMON/D1/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            LENC1510
     1,ALFAP,GRID,ELLNUP,ENUM,ELLBF,PI,RAD,ICASE                        LENC1520
     2,SHAPE,SQURAY,ELLIPS,ICHECK                                       LENC1530
      COMMON/SHP/I1(1010),IIP(1010),I2(1010),I2P(1010)                  LENC1540
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    LENC1550
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               LENC1560
      COMMON/SB/K,L,IZ,IZ1,M,N,NPL,FLAG(1000),IZZ,RAYS,IZZ,DRAYS        LENC1570
     1,ALWCR,CCORD,NUMP,IANGLE,THICK,IZ4,IZ5,CCUNT,IZ6                  LENC1580
     2,CCCR(500),NUMPT,COORT,GAMMA,AB,CMP,STATMA                        LENC1590
     3,RAYY(1000),RAYZ(1000),CENI,TOPRI,ROTI,TOPI                       LENC1600
     4,RADIUS,CEN,TCP,PCT,TURN,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         LENC1610
     5,N2,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LENC1620
     6,API,NPZ,KPK,THETA,PHI,PHIP,AO,BO,CO,DO,EO,PAR1,PAR2             LENC1630
     7,PAR3,XC,YC,ZC,ALP,CMP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,OZ,XI,YI,ZI   LENC1640
     8,NUM5,CKEP,CLPP,CMPP,D3,DPL(1000),DI,NUM6,NUM7,NTNCTY(1000)       LENC1650
     9,YIN(1000),ZIN(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO        LENC1660
      COMMON/SP/NUM8,THETAI,XD(APT(1000),YCIAPT(1000),SUM1              LENC1670
     1,SUM2,SUP2,SIGRAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)           LENC1680
     2,RCC(300),SUM4(300),FPACTN(300),SDRAD(1000),YCENTR(20,500)        LENC1690
C                                                                       LENC1700
      INTEGER ELLNUP,ENUM,SHAPE,SQURAY,ELLIPS                           LENC1710
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,CCUNT,COOR,CCCRT              LENC1720
      REAL N1,N2,N3                                                     LENC1730
      REAL I1,IIP,I2,I2P                                                LENC1740
     1,N2,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LENC1750
      REAL NPI,KPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8      LENC1760
     1,NINCTY                                                           LENC1770
C                                                                       LENC1780
      I1(J)=PI/2.-ALPHA-U                                               LENC1790
      IIP(J)=ARSIN(N1/N2*SIN(I1(J)))                                    LENC1810
      IF(J.EQ.1)CALL INIT                                               LENC1820
      CALL CALETA                                                       LENC1830
      I2(J)=I1(J)-IIP(J)-ETA(J)+U                                       LENC1840
      I2P(J)=ARSIN(N2/N3*SIN(I2(J)))                                    LENC1850
C     CALCULATION OF COORDINATES                                        LENC1860
      IF(J.GT.1)CALL POINTS                                             LENC1870
C     SLOPES OF NORMAL AND TANGENTIAL(SURFACE)                          LENC1880
   17 DYDXT(J)=COTAN(ETA(J))                                            LENC1890
      DYDXN(J)=-TAN(ETA(J))                                             LENC1900
      RETURN                                                            LENC1910
      END                                                               LENC1920
                                                                        LENC1930
      SUBROUTINE INIT                                                   LENC1940
      COMMON/D1/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            LENC1950
     1,ALFAP,GRID,ELLNUP,ENUM,ELLBF,PI,RAD,ICASE                        LENC1960
     2,SHAPE,SQURAY,ELLIPS,ICHECK                                       LENC1970
      COMMON/SHP/I1(1010),IIP(1010),I2(1010),I2P(1010)                  LENC1980
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    LENC1990
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               LENC2000
C                                                                       LENC2010
      REAL N1,N2,N3                                                     LENC2020
      REAL I1,IIP,I2,I2P                                                LENC2030
     1,N2,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LENC2040
C                                                                       LENC2050
      Y1(1)=R                                                           LENC2060
      X1(1)=R/TAN(ALPHA)                                                LENC2070
      X2(1)=X1(1)+T(1)*COS(PI/2.0-ALPHA-IIP(1))                         LENC2080
      Y2(1)=Y1(1)-T(1)*SIN(PI/2.0-ALPHA-IIP(1))                         LENC2090
      BETA(1)=ATAN(Y2(1)/(BF-X2(1)))                                    LENC2100
      RETURN                                                            LENC2110
      END                                                               LENC2120
                                                                        LENC2130
      SUBROUTINE POINTS                                                 LENC2140
      COMMON/D1/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            LENC2150
     1,ALFAP,GRID,ELLNUP,ENUM,ELLBF,PI,RAD,ICASE                        LENC2160
     2,SHAPE,SQURAY,ELLIPS,ICHECK                                       LENC2170
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      COMMON/SHP/I1(1010),I1P(1010),I2(1010),I2P(1010)                  LEN02170
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    LEN02180
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               LEN02190
C                                                                       LEN02200
      REAL N1,N2,N3                                                     LEN02210
      REAL I1,I1P,I2,I2P                                                LEN02220
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LEN02230
C                                                                       LEN02240
      BPF=Y2(J-1)*(-DYDXN(J-1)+COTAN(BETA(J-1)))                        LEN02250
      X2(J)=BPF*(TAN(BETA(J))+DYDXT(J-1))-DYDXT(J-1)*BPF)               LEN02260
     1/(DYDXT(J-1)+TAN(BETA(J)))                                        LEN02270
      Y2(J)=TAN(BETA(J))*(-X2(J)+BPF)                                   LEN02280
      X1(J)=(Y2(J)+X2(J)*COTAN(ALPHA+I1P(J)))                           LEN02290
     1/(TAN(ALPHA)+COTAN(ALPHA+I1P(J)))                                 LEN02300
      Y1(J)=TAN(ALPHA)*X1(J)                                            LEN02310
      I(J)=SQRT((X2(J)-X1(J))**2+(Y1(J)-Y2(J))**2)                      LEN02320
      RETURN                                                            LEN02330
      END                                                               LEN02340
                                                                        LEN02350
      SUBROUTINE CALETA                                                 LEN02360
      COMMON/DT/E,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            LEN02370
     1,ALFAP,GEID,ELLNUM,ENUM,ELLRF,PI,RAD,ICASE                        LEN02380
     2,SHAPE,SCURAY,ELLIPS,ICHECK                                       LEN02390
      COMMON/SHP/I1(1010),I1P(1010),I2(1010),I2P(1010)                  LEN02400
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    LEN02410
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               LEN02420
      COMMON/SP/K,L,IZ,IZ1,M,N,NP1,FLAG(1000),IZ3,RAYS,IZ2,DRAYS        LEN02430
     1,NUMBR,COORD,NUMB,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                  LEN02440
     2,CCCR(5CC),NUMBT,COORT,GAMMA,AB,DNP,STATNA                        LEN02450
     3,RAYY(1000),RAYZ(1000),CENI,TORRI,BOTTI,TOPI                      LEN02460
     4,RADIUS,CEN,TCP,BCT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         LEN02470
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LEN02480
     6,AFI,NPJ,NPK,THETA,PHI,PHIP,AU,BO,CO,DC,EC,PAR1,PAR2              LEN02490
     7,PAR3,XC,YC,ZC,NUP,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI    LEN02500
     8,NUM5,CKPP,CLPP,CMPP,D3,OPL(1000),DI,NUM6,NUM7,NTNCTY(1000)       LEN02510
     9,YIM(1000),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO        LEN02520
      COMMON/SP/NUMB,THETAI,XDIAPT(1000),YDIAPT(1000),SUM1              LEN02530
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)           LEN02540
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,500)        LEN02550
C                                                                       LEN02560
      INTEGER ELLNUM,ENUM,SHAPE,SCURAY,ELLIPS                           LEN02570
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT              LEN02580
      REAL N1,N2,N3                                                     LEN02590
      REAL I1,I1P,I2,I2P                                                LEN02600
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LEN02610
      REAL NPI,NPJ,NPK,NUP,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8      LEN02620
     1,NTNCTY                                                           LEN02630
C                                                                       LEN02640
      AUP=N2/N3*COS(I1(J)-I1P(J)+U)-COS(BETA(J))                        LEN02650
      ADOWN=N2/N3*SIN(I1(J)-I1P(J)+U)-SIN(BETA(J))                      LEN02660
      A=ELP/ADOWN                                                       LEN02670
      X=SQRT(1.0/(1.0+A**2))                                            LEN02680
      ETA(J)=ARSIN(X)                                                   LEN02690
      RETURN                                                            LEN02700
      END                                                               LEN02710
                                                                        LEN02720
      SUBROUTINE SHAPEC                                                 LEN02730
      COMMON/DT/E,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            LEN02740
     1,ALFAP,GEID,ELLNUM,ENUM,ELLRF,PI,RAD,ICASE                        LEN02750
     2,SHAPE,SCURAY,ELLIPS,ICHECK                                       LEN02760
      COMMON/SHP/I1(1010),I1P(1010),I2(1010),I2P(1010)                  LEN02770
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    LEN02780
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               LEN02790
      COMMON/SP/K,L,IZ,IZ1,M,N,NP1,FLAG(1000),IZ3,RAYS,IZ2,DRAYS        LEN02800
     1,NUMBR,COORD,NUMB,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                  LEN02810
     2,CCOR(5CC),NUMBT,COORT,GAMMA,AB,DNP,STATNA                        LEN02820
     3,RAYY(1000),RAYZ(1000),CENI,TORRI,BOTTI,TOPI                      LEN02830
     4,RADIUS,CEN,TCP,BCT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         LEN02840
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LEN02850
     6,AFI,NPJ,NPK,THETA,PHI,PHIP,AU,BO,CO,DC,EC,PAR1,PAR2              LEN02860
     7,PAR3,XC,YC,ZC,NUP,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI    LEN02870
     8,NUM5,CKPP,CLPP,CMPP,D3,OPL(1000),DI,NUM7,NUM7,NTNCTY(1000)       LEN02880
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     9,YIM(1000),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO
      COMMON/SP/NUMP,THETAI,XD(APT(1000),YC(APT(1000),SUM1
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,500)
C
      INTEGER ELLNUM,EAUM,SHAPE,SQURAY,ELLIPS
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,CUOR,COORT
      REAL N1,N2,N3
      REAL II,IIP,I2,I2P
     1,AD,NY,NZ,RX,RY,RZ,AXI,NYI,NZI,PHII,PHIIP,TIRA
      REAL NPI,NPJ,NPK,NUP,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8
     1,NTNCTY
C
      BETA(1)=ATAN(R/(EF-R*COTAN(ALPHA)))
      X2(J)=(R*SIN(BETA(J)))/(SIN(THETA(J))+(TAN(ALPHA))*COS(BETA(J)))
      Y2(J)=(X2(J)*TAN(ALPHA)
      I2F(J)=-ALPHA+ATAN((EF-X2(J))/Y2(J))
      I2(J)=ARSIN((N2/N1)*SIN(I2P(J)))
      UP(J)=PI/2.0-ALPHA-I2(J)
      ETA(J)=UP(J)+I2(J)
      IF(J.GT.1)CALL CALIC
      X1(J)=X2(J)-T(J)*COS(UP(J))
      Y1(J)=Y2(J)+T(J)*SIN(UP(J))
      II(J)=ARSIN(SQRT((SIN(UP(J)-U))**2)/((COS(UP(J)-U)-(N1/N2))**2+
     1(SIN(UP(J)-U))**2)))
      IIP(J)=ARSIN((N1/N2)*SIN(II(J)))
      DYDXN(J)=-TAN((II(J)+U)
      DYDXT(J)=COTAN((II(J)+U)
      RETURN
      END

      SUBROUTINE CALIC
      COMMON/D1/E,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),EF
     1,ALFAP,GFID,ELLNUP,EAUM,ELLBF,PI,RAD,ICASE
     2,SHAPE,SQURAY,ELLIPS,ICHECK
      COMMON/SP/II(1010),IIP(1010),I2(1010),I2P(1010)
     1,ETA(1010),X1(1010),X2(1010),Y1(1010),Y2(1010)
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)
      COMMON/SP/K,L,IZ,IZI,M,N,NPL,FLAG(1000),IZO,RAYS,IZZ,DRAYS
     1,NUMPR,CCOPO,NLMP,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6
     2,CCCP(500),NUMPT,COORT,GAMMA,AM,OMP,STATNA
     3,RAYY(1000),RAYZ(1000),CENI,IOPBI,ROTI,TOPI
     4,RADIUS,CEN,TCP,RCT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP
     5,AX,NY,NZ,RX,RY,RZ,AXI,NYI,NZI,PHII,PHIIP,TIRA
     6,API,NPJ,APK,THETA,PHI,PHIP,AU,HO,CO,DO,EO,PAR1,PAR2
     7,PAR3,XC,YC,ZO,ALP,CKP,CLP,CMP,NUML,NUM2,NUM3,NUM4,C2,XI,YI,ZI
     8,NUM5,CKPP,CLPP,CMPP,D3,OPL(1000),DI,NUM6,NUM7,NTNCTY(1000)
     9,YIM(1000),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO
      COMMON/SP/NUMP,THETAI,XD(APT(1000),YC(APT(1000),SUM1
     1,SUM2,SLP3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,500)
C
      INTEGER ELLNUP,EAUM,SHAPE,SQURAY,ELLIPS
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT
      REAL N1,N2,N3
      REAL II,IIP,I2,I2P
     1,AX,NY,NZ,RX,RY,RZ,AXI,NYI,NZI,PHII,PHIIP,TIRA
      REAL NPI,APJ,APK,AUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8
     1,NTNCTY
C
      YI(J)=((COTAN(II(J-1)+U))*(COTAN(UP(J))))*(Y2(J)+
     1   X2(J)*TAN(UP(J)))+Y1(J-1)-X1(J-1)*COTAN(II(J-1)+U))/(1.0+
     1   (COTAN(II(J-1)+U))*COTAN(UP(J)))
      XI(J)=(COTAN(UP(J)))*(-YI(J)+Y2(J)+X2(J)*TAN(UP(J)))
      T(J)=SQRT((X2(J)-XI(J))**2+(YI(J)-Y2(J))**2)
      RETURN
      END

      SUBROUTINE NOSE
      COMMON/D1/E,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),EF
     1,ALFAP,GFID,ELLNUP,EAUM,ELLBF,PI,RAD,ICASE
     2,SHAPE,SQURAY,ELLIPS,ICHECK
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      COMMON/SHP/X1(1010),X1P(1010),X2(1010),X2P(1010)                  LEN03610
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    LEN03620
     2,J,UP(1010),DYDX1(1010),DYDXN(1010)                               LEN03630
      COMMON/SP/K,L,IZ,IZ1,M,N,NPI,FLAG(1000),IZO,RAYS,IZ2,DRAYS        LEN03640
     1,NUMBR,CCORD,NUMB,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                  LEN03650
     2,CCOR(5CC),NUMET,COORT,GAMMA,AB,ONP,STATNA                        LEN03660
     3,RAYY(1CCC),RAYZ(1000),CENI,TORBI,BOTI,TOPI                       LEN03670
     4,RADIUS,CEN,TCP,RCT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         LEN03680
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LEN03690
     6,NPI,NPJ,NPK,THETA,PHI,PHIP,AU,BO,CO,DC,EC,PAR1,PAR2              LEN03700
     7,PAR3,XC,YO,ZO,NUP,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI    LEN03710
     8,NUM5,CREF,CLPF,CPPP,D3,OPL(10CC),DI,NUM6,NUM7,NTNCTY(1000)       LEN03720
     9,YIM(1000),ZIM(1CCC),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO        LEN03730
      COMMON/SP/NUM8,THETAI,XDIAPT(1000),YDIAPT(1000),SUM1              LEN03740
     1,SLN2,SUP3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)           LEN03750
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,500)        LEN03760
C                                                                       LEN03770
      INTEGER ELLNUM,EALM,SHAPE,SQURAY,ELLIPS                           LEN03780
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT              LEN03790
      REAL N1,N2,N3                                                     LEN03800
      REAL I1,IIP,I2,I2P                                                LEN03810
     1,AX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LEN03820
      REAL NPI,NPJ,NPK,NUP,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8      LEN03830
     1,NTNCTY                                                           LEN03840
C                                                                       LEN03850
C   OPAQUE NOSE SECTION FOLLOWS                                         LEN03860
C                                                                       LEN03870
      GO TO (1,2),ICASE                                                 LEN03880
    1 AB=(-)1(J-1))+(Y1(J-1))/DYDX1(J-1)                                LEN03890
      STATNA=-AB                                                        LEN03900
      GAMMA=ATAN(DYDX1(J-1))                                            LEN03910
      ONP=(Y1(J-1))/SIN(GAMMA)                                          LEN03920
      IF(SHAPE.EC.1)WRITE(6,300)GAMMA,STATNA,ONP                        LEN03930
      GO TO 90                                                          LEN03940
    2 AB=+X2(K)                                                         LEN03950
      BF=BF-AB                                                          LEN03960
      DO 10 J=1,K                                                       LEN03970
      X1(J)=X1(J)-AB                                                    LEN03980
   10 X2(J)=X2(J)-AB                                                    LEN03990
      GO TO 90                                                          LEN04000
  300 FORMAT('C',1X,'OPAQUE NOSE SECTION:'//1X,'NOSE HALF ANGLE = ',    LEN04010
     1F7.5,2X,'STATION A = ',F9.5,2X,'SURFACE LENGTH = ',F7.5////)      LEN04020
   90 RETURN                                                            LEN04030
      END                                                               LEN04040
                                                                        LEN04050
      SUBROUTINE ZOYC                                                   LEN04060
      COMMON/D1/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            LEN04070
     1,ALFAP,GFID,ELLNUP,ENUP,ELLBF,PI,RAD,ICASE                        LEN04080
     2,SHAPE,SCURAY,ELLIPS,ICHECK                                       LEN04090
      COMMON/SHP/X1(1010),X1P(1010),X2(1010),X2P(1010)                  LEN04100
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    LEN04110
     2,J,UP(1010),DYDX1(1010),DYDXN(1010)                               LEN04120
      COMMON/SP/K,L,IZ,IZ1,M,N,NPI,FLAG(1000),IZO,RAYS,IZ2,DRAYS        LEN04130
     1,NUMBR,CCORD,NUMB,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                  LEN04140
     2,CCOR(5CC),NUMET,COORT,GAMMA,AB,ONP,STATNA                        LEN04150
     3,RAYY(1CCC),RAYZ(1000),CENI,TORBI,BOTI,TOPI                       LEN04160
     4,RADIUS,CEN,TCP,RCT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         LEN04170
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LEN04180
     6,NPI,NPJ,NPK,THETA,PHI,PHIP,AU,BO,CO,DC,EC,PAR1,PAR2              LEN04190
     7,PAR3,XC,YO,ZO,NUP,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI    LEN04200
     8,NUM5,CREF,CLPF,CPPP,D3,OPL(10CC),DI,NUM6,NUM7,NTNCTY(1000)       LEN04210
     9,YIM(1000),ZIM(1CCC),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO        LEN04220
      COMMON/SP/NUM8,THETAI,XDIAPT(1000),YDIAPT(1000),SUM1              LEN04230
     1,SLN2,SUP3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)           LEN04240
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,500)        LEN04250
C                                                                       LEN04260
      INTEGER ELLNUM,EALM,SHAPE,SCURAY,ELLIPS                           LEN04270
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT              LEN04280
      REAL N1,N2,N3                                                     LEN04290
      REAL I1,IIP,I2,I2P                                                LEN04300
     1,AX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LEN04310
      REAL NPI,NPJ,NPK,NUP,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8      LEN04320
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     1,NTNCTY                                                          LEN04330
                                                                       LEN04340
C    ALGORITHM TRACE RAY (SEE INPUTS;X1(J),Y1(J),DYDXN(J),X2(J))      LEN04350
       IF(ICHECK.EQ.2)GO TO 21                                         LEN04360
       IF(ICHECK.EQ.30)GO TO 30                                        LEN04370
       IZ=1                                                            LEN04380
       CCUNT=1                                                         LEN04390
       RAYY(IZ)=1.0                                                    LEN04400
       RAYZ(IZ)=0.0                                                    LEN04410
       NTNCTY(IZ)=1.0                                                  LEN04420
       IF(SCURAY .EQ. 1) WRITE(6,400) ALEAP,GRID                       LEN04430
   20  ICHECK=0                                                        LEN04440
       IF(RAYZ(IZ) .GE. Y1(K)) GO TO 32                                LEN04450
         CENI=(ER+X1(K))*SIN(ALEAP)                                    LEN04460
         TCRRI=SQRT(Y1(K)**2-RAYZ(IZ)**2)                              LEN04470
         BCTI=CENI-TCRRI                                               LEN04480
         IF(RAYY(IZ) .LE. BCTI) GO TO 30                               LEN04490
           TOPI=CENI+TCRRI                                             LEN04500
           IF(RAYY(IZ) .GE. TOPI) GO TO 30                             LEN04510
             RAYZ(IZ)=RAYZ(IZ)+GRID                                    LEN04520
             GO TO 20                                                  LEN04530
   30 ICHECK=0                                                         LEN04540
C  SEARCH FOR Y1(J) JUST GT RAYZ(IZ); RETRIEVE X1(J)                   LEN04550
       M=N/2                                                           LEN04560
       IF(Y1(M) .LT. RAYZ(IZ)) GO TO 32                                LEN04570
         IF(RAYY(IZ) .GT. 1.15) GO TO 32                               LEN04580
           M=K-1                                                       LEN04590
   31 CONTINUE                                                         LEN04600
       IF(Y1(M) .GT. RAYZ(IZ)) GO TO 36                                LEN04610
         K=N-1                                                         LEN04620
         IF(N .EQ. 0) GO TO 34                                         LEN04630
         GO TO 31                                                      LEN04640
   32 CONTINUE                                                         LEN04650
       K=M                                                             LEN04660
   33 CONTINUE                                                         LEN04670
       IF(Y1(M) .GT. RAYZ(IZ)) GO TO 36                                LEN04680
         K=N-1                                                         LEN04690
         IF(N .EQ. 0) GO TO 34                                         LEN04700
           GO TO 33                                                    LEN04710
   34 CONTINUE                                                         LEN04720
       RAYZ(IZ)=0.0                                                    LEN04730
       IF(RAYY(IZ) .LT. 0.0) GO TO 35                                  LEN04740
         RAYY(IZ)=RAYY(IZ)+GRID                                        LEN04750
         GO TO 20                                                      LEN04760
   35 CONTINUE                                                         LEN04770
       RAYY(IZ)=RAYY(IZ)-GRID                                          LEN04780
       GO TO 20                                                        LEN04790
  400 FORMAT('1','SKEW RAY TRACE PARAMETERS:'///5X,'ALEAP= ',F9.7,2X,  LEN04800
     1'GRID= ',F6.3,2X,'SEE LENS PARAMETERS ABOVE.'///2X,'RAY',2X,     LEN04810
     2'RAYY',4X,'RAYZ',4X,'XC',6X,'YC',6X,'XI',6X,'YI',6X,'ZI',6X,     LEN04820
     3'OPL',5X,'YIM',5X,'ZIM',5X,'NTNCTY',2X,'XDIAPT',4X,'YDIAPT'      LEN04830
     4/7X,'PHII',6X,'PHIIP',3X,'CKPP',4X,'CLPP',4X,'CMPP',4X,         LEN04840
     5'D2',6X,'D1',6X,'NUM5',4X,'NUM6',4X,'NUM8'//)                   LEN04850
   36 RETURN                                                           LEN04860
       END                                                             LEN04870
                                                                       LEN04880
       SUBROUTINE RAD1                                                 LEN04890
       COMMON/DATA/ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),RF          LEN04900
     1,ALEAP,GRID,ELNUM,ENDY,ELLAF,PI,PAD,ICASE                        LEN04910
     2,SCARF,SCURAY,ELLIPS,ICHECK                                      LEN04920
       COMMON/SEP/I1(1010),I1P(1010),I2(1010),I2P(1010)                LEN04930
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                   LEN04940
     2,J,OPL(1010),DYDXT(1010),DYDXN(1010)                             LEN04950
       COMMON/SK/K,L,IZ,IZ1,A,N,NP1,FLAG(1000),IZO,RAYS,IZZ,CRAYS      LEN04960
     1,NUMER,CCEND,NUMP,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                 LEN04970
     2,CCOP(5CC),NUMB1,CUCRT,GAMMA,AB,UNP,STATNA                       LEN04980
     3,RAYY(1CCC),RAYZ(1000),CENI,TCRBI,BOTI,TOPI                      LEN04990
     4,RADIUS,CEN,TCP,BCT,TORD,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP        LEN05000
     5,AX,AY,AZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIPA                   LEN05010
     6,API,NPJ,APK,THETA,PHI,PHIP,AO,BO,CO,DC,EO,PAR1,PAR2             LEN05020
     7,PAR3,XC,YO,ZC,NLP,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI   LEN05030
     8,NUM5,CKPP,CLPP,CMPP,D3,OPL(1000),DI,NUM6,NUM7,NTNCTY(1000)      LEN05040
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     9,YIM(1000),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO          LEN05050
      COMMON/SP/NUMB,THETA1,XDIAPT(1000),YDIAPT(1000),SUM1                LEN05060
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)             LEN05070
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,500)          LEN05080
C                                                                         LEN05090
      INTEGER ELLNUM,EAUM,SHAPE,SQURAY,ELLIPS                             LEN05100
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT                LEN05110
      REAL N1,N2,N3                                                       LEN05120
      REAL I1,I1P,I2,I2P                                                  LEN05130
     1,AX,AY,AZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                      LEN05140
      REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8        LEN05150
     1,ATNCTY                                                             LEN05160
C                                                                         LEN05170
   36    GO TO (361,362),ICASE                                          LEN05180
  361    YRN=Y1(N)                                                      LEN05190
         YR1=Y1(1)                                                      LEN05200
      RADIUS=SQRT(RAYZ(IZ)**2+((RAYY(IZ)/COS(ALFAP))-(X1(N)+AB)*        LEN05210
     1TAN(ALFAP))**2)                                                   LEN05220
         GO TO 363                                                      LEN05230
  362    YRN=Y2(N)                                                      LEN05240
         YR1=Y2(1)                                                      LEN05250
         Y1=YC+(CLP/CKP*(X2(N)-XO))                                     LEN05260
         Z1=ZC+(CMP/CKP*(X2(N)-XO))                                     LEN05270
      RADIUS=SQRT(Y1**2+Z1**2)                                          LEN05280
  363 IF(YRN .GT. RADIUS) GO TO 40                                      LEN05290
         IF(RADIUS .GT.YR1) GO TO 37                                    LEN05300
         N=N-1                                                          LEN05310
         GO TO 36                                                       LEN05320
   37 CONTINUE                                                          LEN05330
      N=N-1                                                             LEN05340
      IF(N .GT. 0) GO TO 36                                             LEN05350
      CEN=(X1(1)+AB)*SIN(ALFAP)                                         LEN05360
      TORB=Y1(1)*COS(ALFAP)                                             LEN05370
      RAYZ(IZ)=0.0                                                      LEN05380
      IF(RAYY(IZ) .GE. 0.0) GO TO 38                                    LEN05390
         RAYY(IZ)=RAYY(IZ)-GRID                                         LEN05400
         BOT=CEN-TORB                                                   LEN05410
C        CHECK FOR BOTTOM EDGE OF LENS, GO TO MIRROR IMAGE RAYS         LEN05420
         IF(RAYY(IZ) .LT. BOT) ICHECK=60                                LEN05430
         IF(RAYY(IZ) .GE. BOT) ICHECK=20                                LEN05440
         RETURN                                                         LEN05450
   38 CONTINUE                                                          LEN05460
      RAYY(IZ)=RAYY(IZ)+GRID                                            LEN05470
      TOP=CEN+TORB                                                      LEN05480
      IF(RAYY(IZ) .GT. TOP) GO TO 39                                    LEN05490
         ICHECK=20                                                      LEN05500
         RETURN                                                         LEN05510
   39 CONTINUE                                                          LEN05520
      RAYY(IZ)=-GRID                                                    LEN05530
      ICHECK=20                                                         LEN05540
      RETURN                                                            LEN05550
   40 ICHECK=40                                                         LEN05560
      RETURN                                                            LEN05570
      END                                                               LEN05580
                                                                        LEN05590
      SUBROUTINE SKEWC                                                  LEN05600
      COMMON/DT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            LEN05610
     1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                        LEN05620
     2,SHAPE,SQURAY,ELLIPS,ICHECK                                       LEN05630
      COMMON/SEP/I1(1010),I1P(1010),I2(1010),I2P(1010)                  LEN05640
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    LEN05650
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               LEN05660
      COMMON/SK/K,L,IZ,IZ1,4,N,NPI,FIAO(1000),IZO,RAYS,IZ2,DRAYS        LEN05670
     1,ALMBD,COORD,NUMP,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                  LEN05680
     2,COOS(500),NUMPT,COORT,GAMMA,AB,OMP,STATNA                        LEN05690
     3,RAYY(1000),RAYZ(1000),CEN1,TORB1,BOT1,TOP1                       LEN05700
     4,RADIUS,CEN,TCP,BCT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         LEN05710
     5,AX,AY,AZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LEN05720
     6,NPI,NPJ,NPK,THETA,PHI,PHIP,A0,B0,C0,CC,EC,PAR1,PAR2              LEN05730
     7,PAR3,XO,YO,ZC,NUM,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI    LEN05740
     8,NUM5,CREF,CLPF,CMPP,D3,OPL(1000),D1,NUM6,NUM7,ATNCTY(1000)       LEN05750
     9,YIM(1000),ZIM(1 0 1,ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO        LEN05760
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      COMMON/SP/NUMB,THETAI,XDIAPT(1000),YDIAPT(1000),SUM1          LEN05770
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)       LEN05780
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,500)    LEN05790
C                                                                   LEN05800
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                       LEN05810
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT          LEN05820
      REAL N1,N2,N3                                                 LEN05830
      REAL I1,I1P,I2,I2P                                            LEN05840
     1,AX,AY,AZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA               LEN05850
      REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8  LEN05860
     1,NINCTY                                                       LEN05870
C                                                                   LEN05880
   40 NPI=N+1                                                       LEN05890
C     CALCULATE INTERCEPT POINT ON OUTER SURFACE                    LEN05900
      AO=RAYY(IZ)/COS(ALFAP)                                        LEN05910
      BC=TAN(ALFAP)                                                 LEN05920
      CO=(YI(N)-YI(NPI))/(XI(N)-XI(NPI))                            LEN05930
      CC=XI(NPI)                                                    LEN05940
      EC=YI(NPI)                                                    LEN05950
      PAR1=(AC*BC+CO*EC-(CC**2)*DO-AB*(BO**2))                      LEN05960
      PAR2=(EC**2-CC**2)                                            LEN05970
      PAR3=(AC**2+AB*(BC**2)*AB-2.0*AO*BO*AB+                       LEN05980
     1RAYZ(IZ)**2-(EC-CC*DO)**2)                                    LEN05990
      XC=(PAR1/PAR2)+SQRT((PAR1/PAR2)**2-PAR3/PAR2)                 LEN06000
      YC=(RAYY(IZ)/COS(ALFAP))-(XO+AB)*TAN(ALFAP)                   LEN06010
      ZC=RAYZ(IZ)                                                   LEN06020
C     CALCULATE THE DIRECTION COSINES OF OUTSIDE SURFACE NORMAL     LEN06030
      DELTAX=XI(N)-XI(NPI)                                          LEN06040
      DELTAY=YI(N)-YI(NPI)                                          LEN06050
      SP=SQRT((RADIUS-YI(NPI))**2+(XC-XI(NPI))**2)                  LEN06060
      ST=SQRT(DELTAX**2+DELTAY**2)                                  LEN06070
      RATIO=SP/ST                                                   LEN06080
      DYDXNP=RATIO*(DYDXN(N)-DYDXN(NPI))+DYDXN(NPI)                 LEN06090
      NPI=1.0/DYDXNP                                                LEN06100
      IF(YO .EQ. 0.0) GO TO 41                                      LEN06110
        ZOYO=(ZC/YC)                                                LEN06120
        IF(ZOYC .GE. 8235000) GO TO 41                              LEN06130
        IF(ZOYC .LE. -8235000) GO TO 42                             LEN06140
          NPJ=COS(ATAN(ZO/YO))                                      LEN06150
          NPK=SIN(ATAN(ZO/YO))                                      LEN06160
          GO TO 43                                                  LEN06170
   41 CONTINUE                                                      LEN06180
      NPJ=0.0                                                       LEN06190
      NPK=1.0                                                       LEN06200
      GO TO 43                                                      LEN06210
   42 CONTINUE                                                      LEN06220
      NPJ=0.0                                                       LEN06230
      NPK=-1.0                                                      LEN06240
   43 CONTINUE                                                      LEN06250
C     DIRECTION COSINES OF OUTSIDE SURFACE NORMAL                   LEN06260
      NX=NPI/(SQRT(NPI**2+NPJ**2+NPK**2))                           LEN06270
      NY=(NPJ*NX)/NPI                                               LEN06280
      NZ=(NPK*NX)/NPI                                               LEN06290
      IF(RAYY(IZ) .LT. 0.0) GO TO 44                                LEN06300
        GO TO 45                                                    LEN06310
   44 CONTINUE                                                      LEN06320
      NY=-NY                                                        LEN06330
      NZ=-NZ                                                        LEN06340
   45 CONTINUE                                                      LEN06350
C     DIRECTION COSINES OF EXTERNAL RAY                             LEN06360
      RX=COS(ALFAP)                                                 LEN06370
      RY=-SIN(ALFAP)                                                LEN06380
      THETA=ARCOS(RX*NX+RY*NY)                                      LEN06390
C     ANGLES OF INCIDENCE AND REFRACTION OUTSIDE SURFACE            LEN06400
      PHI=PI-THETA                                                  LEN06410
      PHIP=ARSIN((N1/N2)*SIN(PHI))                                  LEN06420
C                                                                   LEN06430
C    INSERT CALCULATION OF TRANSMITED INTENSITY/POLARIZATION        LEN06440
C                                                                   LEN06450
      NUM=COS(PHIP)-(N1/N2)*COS(PHI)                                LEN06460
C     DIRECTION COSINES OF INTERNAL REFRACTED RAY                   LEN06470
      CKP=(N1/N2)*RX-NUM*NX                                         LEN06480
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      CLP=(N1/N2)*RY-NUM*NY                                              LEN06490
      CMP=-NUM*NZ                                                        LEN06500
C     INTERNAL RAY LENGTH AND INSIDE SURFACE INTERCEPT                   LEN06510
      NUM1=(CLP*YO+CMP*ZO-CKP*XO*(TAN(ALPHA)**2))                        LEN06520
      NUM2=(CLP**2+CMP**2-(CKP**2)*(TAN(ALPHA)**2))                      LEN06530
      NUM3=(YO**2+ZO**2-(XO**2)*(TAN(ALPHA)**2))                         LEN06540
      NUM4=NUM1**2-NUM2*NUM3                                             LEN06550
C     CHECK FOR INTERCEPT WITH INSIDE SURFACE                            LEN06560
      IF(NUM4 .LT. 0.0) GO TO 50                                         LEN06570
        D2=-NUM1/NUM2-SQRT(NUM4)/NUM2                                    LEN06580
        XI=D2*CKP+XO                                                     LEN06590
        IF(SQUARY.NE.2)GO TO 99                                          LEN06600
        WRITE(6,97)XI,D2,NUM1,NUM2,NUM3,NUM4,RX,RY,NX,NY,NZ              LEN06610
     1    ,CKP,CLP,CMP,PHI,PHIP,RAYY(IZ),RAYZ(IZ)                        LEN06620
   99   CONTINUE                                                         LEN06630
        IF(XI .LT. 0.0 .OR. XI .GT. X2(I)) GO TO 51                      LEN06640
          YI=D2*CLP+YO                                                   LEN06650
          ZI=D2*CMP+ZO                                                   LEN06660
          NUM5=SQRT((XI**2)*(TAN(ALPHA)**4)+YI**2+ZI**2)                 LEN06670
C         DIRECTION COSINES OF INSIDE NORMAL                             LEN06680
          NXI=-XI*(TAN(ALPHA)**2)/NUM5                                   LEN06690
          NYI=YI/NUM5                                                    LEN06700
          NZI=ZI/NUM5                                                    LEN06710
          THETAI=ARCOS((CKP*NXI)+(CLP*NYI)+(CMP*NZI))                    LEN06720
C         ANGLES OF INCIDENCE AND TOTAL INTERNAL REFLECTION              LEN06730
C         AT THE INSIDE SURFACE:                                         LEN06740
          PHII=PI-THETAI                                                 LEN06750
          TIRA=ARSIN(N3/N2)                                              LEN06760
C         CHECK FOR TOTAL INTERNAL REFLECTION:                           LEN06770
          IF(PHII .GE. TIRA) GO TO 52                                    LEN06780
            PHIP=ARSIN((N2/N3)*SIN(PHII))                                LEN06790
        RETURN                                                           LEN06800
   50   ICHECK=50                                                        LEN06810
        RETURN                                                           LEN06820
   51   ICHECK=51                                                        LEN06830
        RETURN                                                           LEN06840
   52   ICHECK=52                                                        LEN06850
   97   FORMAT(3X,11E8.3/3X,7E8.3)                                       LEN06860
        RETURN                                                           LEN06870
      END                                                                LEN06880
                                                                         LEN06890
      SUBROUTINE SKENT                                                   LEN06900
      COMMON/D1/E,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),PE             LEN06910
     1,ALEAP,GRID,ELLNUM,ENUM,ELLRF,PI,RAD,ICASE                         LEN06920
     2,SHAPE,SQUARY,ELLIPS,ICHECK                                        LEN06930
      COMMON/SKP/II(1010),IIP(1010),I2(1010),I2P(1010)                   LEN06940
     1,ETA(101C),X1(101C),Y1(1010),X2(1010),Y2(1010)                     LEN06950
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                                LEN06960
      COMMON/SK/K,L,IZ,IZ1,M,N,NP1,FLAG(1001),IZ1,RAYS,IZ2,DRAYS         LEN06970
     1,NUMBR,COORD,NUMP,ANGLE,THICK,IZ4,IZ5,COUNT,IZ6                    LEN06980
     2,COOR(5CC),NUMBT,COORT,GAMMA,AB,ONP,STATNA                         LEN06990
     3,RAYY(1CCC),RAYZ(1CCC),CENT,TORB1,BOTT,TOPT                        LEN07000
     4,RADIUS,CEN,TCE,PCT,TURB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP          LEN07010
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                     LEN07020
     6,NPI,NPJ,NPK,THETA,PHI,PHIP,AU,BU,CU,DC,EU,PAR1,PAR2               LEN07030
     7,PAR3,XO,YO,ZO,NUM,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,C2,XI,YI,ZI     LEN07040
     8,NUM5,CKEP,CLPE,CMPP,D3,OPLE(1CCC),D1,NUM6,NUM7,NTNCTY(1001)       LEN07050
     9,YIM(1CCC),ZIM(1CCC),ELL,ELYI7,1)),ELZI7,1CCC),ELZZ,ZDYO           LEN07060
      COMMON/SP/NUMR,THETAI,XDIAPT(1CCC),YDIAPT(1CCC),SUM1               LEN07070
     1,SUM2,SUM3,SIGMAZ(10,50),SIGMAY(10,50),PRMSRAD(10,50)              LEN07080
     2,RCC(30C),SUM4(30C),FRACTN(221),SUMAD(1CCC),YCENTR(20,50)          LEN07090
C                                                                        LEN07100
      INTEGER ELLNUM,ENUM,SHAPE,SQUARY,ELLIPS                            LEN07110
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT               LEN07120
      REAL N1,N2,N3                                                      LEN07130
      REAL II,IIP,I2,I2P                                                 LEN07140
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                     LEN07150
      REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUMR       LEN07160
     1,NTNCTY                                                            LEN07170
C                                                                        LEN07180
        AS=TAN(ALPHA)                                                    LEN07190
        CS=RAYY(IZ)/COS(ALPHA)                                           LEN07200
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      DS=TAN(ALFAP)                                                     LEN07210
      A2D2=CS**2-DS**2                                                  LEN07220
      CDS=CS*DS*(AB)*A2D2                                               LEN07230
      C7D=CS**2*RAYZ(IZ)**2-((AB)**2)*A2D2-2.0*CS*DS*(AB)               LEN07240
      XC=1.0/A2D2*(-CDS*SQRT(CDS**2+A2D2*(C7D)))                        LEN07250
      YC=CS-(XC+AB)*DS                                                  LEN07260
      ZC=RAYZ(IZ)                                                       LEN07270
      NX=-SIN(ALFAP)                                                    LEN07280
      IF(YC .EQ. 0.0) GO TO 41                                          LEN07290
      ZOYC=(ZC/YC)                                                      LEN07300
      IF(ZOYC .GE. 8235929) GO TO 41                                    LEN07310
      IF(ZOYC .LE. -8235929) GO TO 42                                   LEN07320
      SIG=ATAN(ZOYO)                                                    LEN07330
C     DIRECTION COSINES OF OUTSIDE SURFACE NORMAL                       LEN07340
      NY=COS(SIG)*COS(ALPHA)                                            LEN07350
      NZ=SIN(SIG)*COS(ALPHA)                                            LEN07360
      GO TO 43                                                          LEN07370
   41   NY=0.0                                                          LEN07380
        NZ=1.0*COS(ALPHA)                                               LEN07390
        GO TO 43                                                        LEN07400
   42   NY=0.0                                                          LEN07410
        NZ=-1.0*COS(ALPHA)                                              LEN07420
   43   CONTINUE                                                        LEN07430
        IF(RAYY(IZ).GE.0.0)GO TO 45                                     LEN07440
        NY=-NY                                                          LEN07450
        NZ=-NZ                                                          LEN07460
   45 CONTINUE                                                          LEN07470
C     DIRECTION COSINES OF RAY                                          LEN07480
      RX=COS(ALFAP)                                                     LEN07490
      RY=-SIN(ALFAP)                                                    LEN07500
      RZ=0.0                                                            LEN07510
C     ANGLES OF INCIDENCE AND REFRACTION OUTSIDE SURFACE                LEN07520
      THETA=ARCOS(NX*RX+NY*RY)                                          LEN07530
      PHI=PI-THETA                                                      LEN07540
      PHIP=ARSIN((N1/N2)*SIN(PHI))                                      LEN07550
C                                                                       LEN07560
C      DIRECTION COSINES OF INTERNAL REFRACTED RAY                      LEN07570
      NUM=COS(PHIP)-N1/N2*COS(PHI)                                      LEN07580
      CKP=N1/N2*RX-NUM*NX                                               LEN07590
      CLP=N1/N2*RY-NUM*NY                                               LEN07600
      CMP=-NUM*NZ                                                       LEN07610
C     ITERATION TO FIND CORRECT PLACE                                   LEN07620
      CALL FADI                                                         LEN07630
      IF(ICHECK.NE.40)RETURN                                            LEN07640
   40 NP1=N+1                                                           LEN07650
C     INTERNAL RAY LENGTH AND INSIDE SURFACE INTERCEPT                  LEN07660
      AR=(Y2(N)-Y2(NP1))/(X2(N)-X2(NP1))                                LEN07670
      BR=(Y2(N)*X2(NP1)-Y2(NP1)*X2(N))/(X2(N)-X2(NP1))                  LEN07680
      APR=CLP**2+CMP**2-(AR*CKP)**2                                     LEN07690
      BPR=CLP*YC+CMP*ZC-CKP*AR**2*(XC-BR/AR)                            LEN07700
      CPR=YC**2+ZC**2-AR**2*XO*(XO-2.0*BR/AR)-BR**2                     LEN07710
        DEC=BPR**2-APR*CPR                                              LEN07720
        IF(DEC.LT.0.0)GO TO 50                                          LEN07730
      D2=-BPR/APR+ABS(SQRT(DEC)/APR)                                    LEN07740
      X1=CKP*D2+XC                                                      LEN07750
      IF(SQURAY.NE.2)GO TO 89                                           LEN07760
      WRITE(6,87)IZ,X1,D2,APR,BPR,CPR,DEC,BR,AR,CMP,CLP,CKP,NUM,PHIP,PHI LEN07770
     1,RX,RY,RZ,NX,NY,NZ,XC,YO,ZO,RAYY(IZ),RAYZ(IZ)                     LEN07780
   89 CONTINUE                                                          LEN07790
        IF(X1 .LT. 0.0 .OR. X1 .GT. X2(1)) GO TO 51                     LEN07800
      Y1=CLP*D2+YC                                                      LEN07810
      Z1=CMP*D2+ZC                                                      LEN07820
C                                                                       LEN07830
C      DIRECTION COSINES OF INSIDE NORMAL                               LEN07840
        APFUN=SQRT(1.0+AP**2)                                           LEN07850
        YZFUN=SQRT(Y1**2+Z1**2)                                         LEN07860
        NXI=-AP/APFUN                                                   LEN07870
        NYI=+Y1/(YZFUN*APFUN)                                           LEN07880
        NZI=+Z1/(YZFUN*APFUN)                                           LEN07890
      COTE=NXI*CKP+NYI*CLP+NZI*CMP                                      LEN07900
      IF(COTE.GT.1.0)COTE=1.0                                           LEN07910
      IF(COTE.LT.(-1.0))COTE=-1.0                                       LEN07920
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      IF(SQURAY.NE.2)GO TO 99                                          LEN07930
      WRITE(6,57)YI,ZI,ARFUN,YZFUN,NXI,NYI,NZI,COTE                    LEN07940
   99 CONTINUE                                                         LEN07950
C       ANGLES OF INCIDENCE OF INSIDE SURFACE                          LEN07960
        THETAI=ARCOS(COTE)                                             LEN07970
        PHII=FI-THETAI                                                 LEN07980
C       CHECK FOR TOTAL INTERNAL REFLECTION:                           LEN07990
        TIRA=ARSIN(N3/N2)                                              LEN08000
        IF(PHII .GE. TIRA) GO TO 52                                    LEN08010
        PHIIP=ARSIN(N2/N3*SIN(PHII))                                   LEN08020
      RETURN                                                           LEN08030
   50   ICHECK=50                                                       LEN08040
        RETURN                                                         LEN08050
   51   ICHECK=51                                                       LEN08060
        RETURN                                                         LEN08070
   52   ICHECK=52                                                       LEN08080
   87 FORMAT(1),I2,1IF6.3/3X,14F8.3/)                                  LEN08090
   97 FORMAT(3),8F8.3/)                                                LEN08100
        RETURN                                                         LEN08110
      END                                                              LEN08120
                                                                       LEN08130
       SUBROUTINE INTENS                                               LEN08140
      COMMON/D1/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF           LEN08150
     1,ALFAP,GRID,ELLNUP,ENUM,ELLBF,PI,RAD,ICASE                       LEN08160
     2,SHAPE,SQURAY,ELLIPS,ICHECK                                      LEN08170
      COMMON/SP/I1(1010),IIP(1010),I2(1010),I2P(1010)                  LEN08180
     1,ETA(101C),X1(101C),Y1(1010),X2(1010),Y2(1010)                   LEN08190
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                              LEN08200
      COMMON/SP/K,L,IZ,IZ1,M,N,NP1,FLAG(1000),IZ0,RAYS,IZ2,DRAYS       LEN08210
     1,ALMBR,CCORD,NUMB,IANGLE,THICK,IZ4,IZ5,CCUNT,IZ6                 LEN08220
     2,CCCK(50C),NUMET,COORT,GAMMA,AB,ONP,STATNA                       LEN08230
     3,RAYY(1000),RAYZ(1000),CENI,TORBI,BUTI,TOPI                      LEN08240
     4,RADIUS,CEN,TOP,BOT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP        LEN08250
     5,AX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                   LEN08260
     6,AFI,NFJ,AFK,THETA,PHI,PHIP,A0,B0,C0,CC,EC,PAR1,PAR2             LEN08270
     7,PAR3,XC,YC,ZC,NUM,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI   LEN08280
     8,ALM5,CKFP,CLPP,CMPP,D3,OPL(1000),D1,NUM6,NUM7,NTNCTY(1000)      LEN08290
     9,YIM(100C),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO       LEN08300
      COMMON/SP/NUM8,THETAI,XDIAPT(1000),YDIAPT(1000),SUM1             LEN08310
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)          LEN08320
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,500)       LEN08330
C                                                                      LEN08340
      INTEGER ELLNUM,EALM,SHAPE,SQURAY,ELLIPS                          LEN08350
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,CCUNT,COOR,COORT             LEN08360
      REAL N1,N2,N3                                                    LEN08370
      REAL I1,IIP,I2,I2P                                               LEN08380
     1,AX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                   LEN08390
      REAL NP1,AFJ,AFK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8     LEN08400
     1,NTNCTY                                                          LEN08410
C                                                                      LEN08420
        IF(ICHECK.EC.50)GO TO 50                                       LEN08430
        IF(ICHECK.EC.51)GO TO 51                                       LEN08440
        IF(ICHECK.EC.52)GO TO 52                                       LEN08450
C INSERT CALCULATION OF TRANSMITTED INTENSITY                          LEN08460
C                                                                      LEN08470
           NUM8=COS(PHIIP)-(N2/N3)*COS(PHII)                           LEN08480
C          DIRECTION COSINES OF INSIDE EXTERNAL REFRACTED RAY          LEN08490
           CKFP=(N2/N3)*CKP-NUM8*NXI                                   LEN08500
           CLFP=(N2/N3)*CLP-NUM8*NYI                                   LEN08510
           CMFP=(N2/N3)*CMP-NUM8*NZI                                   LEN08520
C          LENGTH OF INSIDE EXTERNAL REFRACTED RAY                     LEN08530
           D3=(BF-XI)/CKPP                                             LEN08540
           NUM6=((XC+AB)*RX+YC*RY)                                     LEN08550
           NUM7=((XC+AB)*(-RY)+YC*RX)                                  LEN08560
C          LENGTH OF OUTSIDE INCIDENT RAY                              LEN08570
           D1=SQRT((XC-NUM4)**2+(YC-NUM7)**2)                          LEN08580
C          TOTAL OPTICAL PATHLENGTH:                                   LEN08590
           OPL(IZ)=A1*D1+A2*D2+N3*D3                                   LEN08600
C          INTERSECTION WITH THE IMAGE PLANE:                          LEN08610
           YIM(IZ)=((BF-XI)/CKPP)*CLPP+YI                              LEN08620
           ZIM(IZ)=((BF-XI)/CKPP)*CMPP+ZI                              LEN08630
      IF(SQURAY.NE.2)GO TO 99                                          LEN08640
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      WRITE(6,97)IZ,CKF,CLP,CMP,NXI,NYI,NZI,NUM8,CKPP,CLPP,CMPP          LEN08650
     1            ,XI,YI,ZI,XC,YO,RX,RY,BF,NUM6,NUM7                     LEN08660
     2            ,C1,D2,D3,YIM(IZ),ZIM(IZ),PHII,PHIIP                   LEN08670
   95 CONTINUE                                                           LEN08680
      IF(CMPP .LT. 0.000000000001 .AND. CMPP .GT. -0.000000000001)       LEN08690
     1   GO TO 46                                                        LEN08700
         XDIAPT(IZ)=(-ZIM(IZ)/CMPP)*CKPP+AB                              LEN08710
         YDIAPT(IZ)=(-ZIM(IZ)/CMPP)*CLPP+YIM(IZ)                         LEN08720
         GO TO 47                                                        LEN08730
   46 CONTINUE                                                           LEN08740
         XDIAPT(IZ)=99999.                                               LEN08750
         YDIAPT(IZ)=99999.                                               LEN08760
   47 CONTINUE                                                           LEN08770
      IF(SQURAY .EQ. 1) WRITE(6,500)IZ,RAYY(IZ),RAYZ(IZ),XO,YO,          LEN08780
     1   XI,YI,ZI,OPL(IZ),YIM(IZ),ZIM(IZ),NTNCTY(IZ),XDIAPT(IZ),        LEN08790
     2   YDIAPT(IZ)                                                      LEN08800
     3   ,PHII,PHIIP,CKPP,CLPP,CMPP,D3,D1,NUM6,NUM7,NUM8                 LEN08810
  471   FLAG(IZ)=0                                                      LEN08820
   49 CONTINUE                                                           LEN08830
      IZ1=IZ                                                           LEN08840
      IZ=IZ1+1                                                         LEN08850
      NTNCTY(IZ)=1.0                                                   LEN08860
      RAYY(IZ)=RAYY(IZ1)                                               LEN08870
      RAYZ(IZ)=RAYZ(IZ1)+GRID                                          LEN08880
      IF(FLAG(IZ1) .EQ. 0) COUNT=COUNT+1                               LEN08890
      ICHECK=3                                                         LEN08900
      RETURN                                                           LEN08910
C     END OF RAY TRACE                                                 LEN08920
   50 ICHECK=0                                                         LEN08930
      NTNCTY(IZ)=0.0                                                   LEN08940
      FLAG(IZ)=1                                                       LEN08950
      IF(SQURAY .EQ. 1) WRITE(6,600)IZ,RAYY(IZ),RAYZ(IZ),PHI,PHIP      LEN08960
      GO TO 49                                                         LEN08970
   51 ICHECK=0                                                         LEN08980
      NTNCTY(IZ)=0.0                                                   LEN08990
      FLAG(IZ)=2                                                       LEN09000
      IF(SQURAY .EQ. 1) WRITE(6,700)IZ,RAYY(IZ),RAYZ(IZ),XI            LEN09010
      GO TO 49                                                         LEN09020
   52 ICHECK=0                                                         LEN09030
      NTNCTY(IZ)=0.0                                                   LEN09040
      FLAG(IZ)=3                                                       LEN09050
      IF(SQURAY .EQ. 1) WRITE(6,800)IZ,RAYY(IZ),RAYZ(IZ),PHII,TIRA     LEN09060
      GO TO 49                                                         LEN09070
   97 FORMAT(1X,I2,10F9.5/3X,10F9.5/3X,7F9.5/)                         LEN09080
  500 FORMAT(1X,I4,11F8.5,1X,2E10.3/4X,10F8.4/)                        LEN09090
  600 FORMAT(1X,I4,2F10.7,' NO INTERCEPT WITH 2ND SURFACE; PHI= ',F10.7,LEN09100
     1',PHIP= ',F10.7/)                                                LEN09110
  700 FORMAT(1X,I4,2F10.7,' INTERCEPT OUTSIDE BOUNDARY OF 2ND SURFACE; XLEN09120
     1I =',F10.7/)                                                     LEN09130
  800 FORMAT(1X,I4,2F10.7,2X,'TOTAL INTERNAL REFLECTION AT 2ND SURFACE;LEN09140
     1PHII= ',F10.7,' ,TIRA= ',F10.7/)                                 LEN09150
      END                                                              LEN09160
                                                                       LEN09170
      SUBROUTINE IMAGE                                                 LEN09180
      COMMON/DIMF,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF           LEN09190
     1,ALFAP,GRID,ELLRAD,ENUM,ELLBF,PI,RAD,ICASE                       LEN09200
     2,SHAPE,SQURAY,ELLIPS,ICHECK                                      LEN09210
      COMMON/SHP/I1(1010),I1P(1010),I2(1010),I2P(1010)                 LEN09220
     1,ETA(101C),X1(101C),Y1(1010),X2(1010),Y2(1010)                   LEN09230
     2,J,UP(1011),DYDXT(1010),DYDXN(1010)                              LEN09240
      COMMON/SK/K,L,IZ,IZ1,M,N,NP1,FLAG(1000),IZ0,RAYS,IZ2,DRAYS       LEN09250
     1,NUMBR,CCORD,NUMP,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                 LEN09260
     2,CCCP(500),NUMPT,COORT,GAMMA,AR,ONP,STATNA                       LEN09270
     3,RAYY(1000),RAYZ(1000),CENI,TORBI,BOTI,TOPI                      LEN09280
     4,RADIUS,CEN,TCP,BCT,TORB,DELTAX,DELTAY,SP,ST,RATIC,DYDXNP        LEN09290
     5,AX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                   LEN09300
     6,AFI,NPJ,APK,THETA,PEI,PHIP,AC,BD,CD,DC,FC,PAR1,PAR2             LEN09310
     7,PAR3,XC,YO,ZC,NUM,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI  LEN09320
     8,NUM5,CKFF,CLPF,CMPP,D3,OPL(1000),D1,NUM6,NUM7,NTNCTY(1000)      LEN09330
     9,YIM(1000),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO       LEN09340
      COMMON/SP/NUMP,THETAI,XDIAPT(1000),YDIAPT(1000),SUM1             LEN09350
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)          LEN09360
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     2,ROC(300),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,50)          LEN09370
C                                                                        LEN09380
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                            LEN09390
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT               LEN09400
      REAL N1,N2,N3                                                      LEN09410
      REAL I1,I1P,I2,I2P                                                 LEN09420
     1,AX,NY,NZ,RX,RY,RZ,NX1,NY1,NZ1,PHI1,PHI1P,TIRA                     LEN09430
      REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8       LEN09440
     1,NINCTY                                                            LEN09450
C                                                                        LEN09460
C     MIRROR IMAGE RAY PATCHING FOLLOWS                                  LEN09470
C                                                                        LEN09480
   60 CONTINUE                                                           LEN09490
      IF(SQURAY .EQ. 1) WRITE(6,401)                                     LEN09500
      IZC=IZ-1                                                           LEN09510
      IZ2=IZ-120                                                         LEN09520
   61 CONTINUE                                                           LEN09530
      IF(RAYZ(IZ2) .EQ. 0.0) IZ2=IZ2+1                                   LEN09540
         IF(IZ2 .GT. IZC) GO TO 70                                       LEN09550
           FLAG(IZ)=FLAG(IZ2)                                            LEN09560
           IF(FLAG(IZ) .EQ. 0) COUNT=COUNT+1                             LEN09570
           RAYY(IZ)=RAYY(IZ2)                                            LEN09580
           RAYZ(IZ)=-RAYZ(IZ2)                                           LEN09590
           IF(FLAG(IZ2) .GE. 1) GO TO 63                                 LEN09600
             XDIAPT(IZ)=XDIAPT(IZ2)                                      LEN09610
             YDIAPT(IZ)=YDIAPT(IZ2)                                      LEN09620
             YIM(IZ)=YIM(IZ2)                                            LEN09630
             ZIM(IZ)=-ZIM(IZ2)                                           LEN09640
             OPL(IZ)=OPL(IZ2)                                            LEN09650
             NINCTY(IZ)=NINCTY(IZ2)                                      LEN09660
             IF(SQURAY .EQ. 1) WRITE(6,501) IZ,IZ2,RAYY(IZ),RAYZ(IZ),    LEN09670
     1       OPL(IZ),YIM(IZ),ZIM(IZ),NINCTY(IZ),XDIAPT(IZ),YDIAPT(IZ)    LEN09680
   62 CONTINUE                                                           LEN09690
      IZ2=IZ2+1                                                          LEN09700
      IZ=IZ+1                                                            LEN09710
      GO TO 61                                                           LEN09720
   63 CONTINUE                                                           LEN09730
      IF(FLAG(IZ2) .GE. 2) GO TO 64                                      LEN09740
         IF(SQURAY .EQ. 1) WRITE(6,601)IZ,IZ2,RAYY(IZ),RAYZ(IZ)          LEN09750
         GO TO 62                                                        LEN09760
   64 CONTINUE                                                           LEN09770
      IF(FLAG(IZ2) .EQ. 3) GO TO 65                                      LEN09780
         IF(SQURAY .EQ. 1) WRITE(6,701)IZ,IZ2,RAYY(IZ),RAYZ(IZ)          LEN09790
         GO TO 62                                                        LEN09800
   65 CONTINUE                                                           LEN09810
      IF(SQURAY .EQ. 1) WRITE(6,801)IZ,IZ2,RAYY(IZ),RAYZ(IZ)             LEN09820
      GO TO 62                                                           LEN09830
   70 CONTINUE                                                           LEN09840
      RAYS=IZ-1                                                          LEN09850
      DRAYS=RAYS-IZ0                                                     LEN09860
      IF(SQURAY .EQ. 1) WRITE(6,900)RAYS,DRAYS,COUNT                     LEN09870
C                                                                        LEN09880
C     GENERATE OBJECT PLANE ELLIPSES:                                    LEN09890
C                                                                        LEN09900
      IF(ELLIPS .EQ. 1) WRITE(6,1000)ENUM                                LEN09910
      NUMBR=1                                                            LEN09920
      NUMB=1                                                             LEN09930
   71 CONTINUE                                                           LEN09940
      COORD=1                                                            LEN09950
      ELZ(NUMB,COORD)=-YI(NUMBR)                                         LEN09960
   72 CONTINUE                                                           LEN09970
      ELY(NUMB,COORD)=(X1(NUMBR)+AB)*SIN(ALFAP)+SQRT((Y1(NUMBR))**2-     LEN09980
     1(ELZ(NUMB,COORD))**2)*COS(ALFAP)                                   LEN09990
      ELZZ=ELZ(NUMB,COORD)                                               LEN10000
      IF(ELLIPS .EQ. 1) WRITE(6,1100)NUMBR,COORD,ELY(NUMB,COORD),        LEN10010
     1ELZ(NUMB,COORD)                                                    LEN10020
      COORD=COORD+1                                                      LEN10030
      ELZ(NUMB,COORD)=ELZZ+ELL                                           LEN10040
      IF(ELZ(NUMB,COORD) .GE. YI(NUMBR)) GO TO 73                        LEN10050
         GO TO 72                                                        LEN10060
   73 CONTINUE                                                           LEN10070
      ELZZ=ELZ(NUMB,COORD)                                               LEN10080
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   74 CONTINUE                                                          LEN10090
      ELZ(NUMB,CCORD)=ELZZ-ELL                                          LEN10100
      IF(ELZ(NUMB,CCORD) .LE. -Y1(NUMBR)) GO TO 75                      LEN10110
      ELY(NUMB,CCORD)=(X1(NUMBR)+AB)*SIN(ALFAP)-SQRT((Y1(NUMBR))**2-    LEN10120
     1(ELZ(NUMB,CCORD))**2)*COS(ALFAP)                                  LEN10130
      ELZZ=ELZ(NUMB,CCORD)                                              LEN10140
      IF(ELLIPS .EQ. 1) WRITE(6,1100)NUMBR,CCORD,ELY(NUMB,CCORD),       LEN10150
     1ELZ(NUMB,CCORD)                                                   LEN10160
      CCCR(NUMB)=CCORD                                                  LEN10170
      CCCRD=CCCRD+1                                                     LEN10180
      GO TO 74                                                          LEN10190
   75 CONTINUE                                                          LEN10200
      NUMBR=NUMBR+(K-1)/ELLNUM                                          LEN10210
      NUMB=NUMB+1                                                       LEN10220
      IF(NUMBR .GT. K) GO TO 76                                         LEN10230
      GO TO 71                                                          LEN10240
   76 CONTINUE                                                          LEN10250
      IF(ELLIPS .EQ. 1) WRITE(6,1200)                                   LEN10260
      NUMBT=NUMB-1                                                      LEN10270
C                                                                       LEN10280
C     IMAGE PLANE SPOT DIAGRAM STATISTICAL ANALYSIS:                    LEN10290
C                                                                       LEN10300
      SUM1=0.0                                                          LEN10310
      DO 77 IZ=1,RAYS                                                   LEN10320
        IF(FLAG(IZ) .GT. 0) GO TO 77                                    LEN10330
          SUM1=YIM(IZ)+SUM1                                             LEN10340
   77 CONTINUE                                                          LEN10350
C     REFERENCE EACH ITERATION TO INCIDENT ANGLE & THICKNESS BY:        LEN10360
      IANGLE=ALFAP*10                                                   LEN10370
      THICK=(T(1))*100                                                  LEN10380
C     CENTROID OF SPOT:                                                 LEN10390
      YCENTR(IANGLE,THICK)=SUM1/COUNT                                   LEN10400
C     STANDARD DEVIATIONS:                                              LEN10410
      SUM2=0.0                                                          LEN10420
      SUM3=0.0                                                          LEN10430
      DO 78 IZ=1,RAYS                                                   LEN10440
        IF(FLAG(IZ) .GT. 0) GO TO 78                                    LEN10450
        SUM2=ZIP(IZ)**2+SUM2                                            LEN10460
        SUM3=(YCENTR(IANGLE,THICK)-YIM(IZ))**2+SUM3                     LEN10470
   78 CONTINUE                                                          LEN10480
      SIGMAZ(IANGLE,THICK)=SUM2/COUNT                                   LEN10490
      SIGMAY(IANGLE,THICK)=SUM3/COUNT                                   LEN10500
C     RMS MEAN SQUARE SPOT SIZE:                                        LEN10510
      RMSRAD(IANGLE,THICK)=SQRT(SIGMAZ(IANGLE,THICK)+SIGMAY(IANGLE,     LEN10520
     1THICK))                                                           LEN10530
  401 FORMAT('1',' MIRROR IMAGE SKEW RAYS FOLLOW'///1X,'IMAGE'/2X,'RAY  RLEN10540
     1AY   RAYY        RAYZ        OPL         YIM         ZIP        NTNCTY  LEN10550
     1      XDIAPT'/81X,'YDIAPT'//)                                    LEN10560
  501 FORMAT(I4,1X,I4,2F10.7,F13.9,3F10.7,E15.3/72X,F15.3/)             LEN10570
  601 FORMAT(I4,1X,I4,2F10.7,' NO INTERCEPT WITH 2ND SURFACE'/)         LEN10580
  701 FORMAT(I4,1X,I4,2F10.7,' INTERCEPT OUTSIDE OF BOUNDARY OF 2ND SUPFLEN10590
     1ACE'/)                                                            LEN10600
  801 FORMAT(I4,1X,I4,2F10.7,' TOTAL INTERNAL REFLECTION'/)             LEN10610
  900 FORMAT(1X,'END OF SKEW RAY TRACE.'//3X,'TOTAL NUMBER OF RAYS TRACELEN10620
     1D = ',I4/3X,'TOTAL NUMBER OF MIRROR IMAGE RAYS = ',I4/3X,'TOTAL NULEN10630
     1MBER OF RAYS STRIKING IMAGE PLANE = ',I4)                         LEN10640
 1000 FORMAT('1',' TWO DIMENSIONAL PROJECTION OF 3-DIM LENS'///3X,'GENERALEN10650
     1TED ELLIPSES ARE REFERENCED TO THE CORRESPONDING JTH COORDINATE  ILEN10660
     1N THE MERIDIAN PLANES AS COMPUTED IN THE ABOVE'/3X,'GLW LENS SHAPELEN10670
     1 ALGORITHM. INSIDE AND OUTSIDE ELLIPSES CORRESPOND TO THE OPAQUE RLEN10680
     1CURVATURES.'/3X,'THE NUMBER OF ELLIPSES GENERATED = ',I3//1X,'    J LEN10690
     1 CCORD      ELY         ELZ'//)                                   LEN10700
 1100 FORMAT(1),I4,4),I4,2F10.7)                                        LEN10710
 1200 FORMAT(1X,'CALCULATION OF ELLIPSE COORDINATES COMPLETE.')         LEN10720
      RETURN                                                            LEN10730
      END                                                               LEN10740
                                                                        LEN10750
      SUBROUTINE SUMM                                                   LEN10760
      COMMON/UTIL/ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),DF            LEN10770
     1,ALFAP,GFID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                        LEN10780
     2,SHAPE,SGLRAY,ELLIPS,ICHECK                                       LEN10790
      COMMON/SFP/II(1010),IIP(1010),I2(1010),I2P(1010)                  LEN10800
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     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    LEN11510
     2,J,UP(1010),DYDXT(1010),DYDXA(1010)                               LEN11520
      COMMON/SKZ/K,L,IZ,IZ1,M,N,MP1,FLAG(1000),IZ1,RAYS,IZZ,DRAYS       LEN11530
     1,ALPHA,CCCRD,NUMP,IANGLE,THICK,IZ4,IZZ,COUNT,IZ6                  LEN11540
     2,CCCR(500),NLMBT,COORT,GAMMA,AR,DNP,STATNA                        LEN11550
     3,RAYY(1000),RAYZ(1000),CENI,TORBI,BOTI,TOPI                       LEN11560
     4,RADIUS,CEN,TOP,BOT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         LEN11570
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LEN11580
     6,API,NPJ,NPK,TPETA,PFI,PHIP,A0,B0,C0,DE,EP,PAR1,PAR2              LEN11590
     7,PAR3,XC,YC,ZC,RLP,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI    LEN11600
     8,SLM5,CKEP,CLPP,CMPP,U3,OPL(1000),DL,NUM6,NUM7,NTACTY(1000)       LEN11610
     9,YIM(1000),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO        LEN11620
      COMMON/SP/NUMB,THETA1,XD1APT(1000),YCIAPT(1000),SUM1              LEN11630
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)           LEN11640
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,500)        LEN11650
C                                                                       LEN11660
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                           LEN11670
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COMP,COORT              LEN11680
      REAL N1,N2,N3                                                     LEN11690
      REAL II,IIP,I2,I2P                                                LEN11700
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LEN11710
      REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8      LEN11720
     1,NTACTY                                                           LEN11730
C                                                                       LEN11740
C WRITE PARAMETER SUMMARY HERE                                          LEN11750
C                                                                       LEN11760
      WRITE(6,1300)T(1),U,ALFAP,R,YCENTR(IANGLE,THICK),                 LEN11770
     1SIGMAY(IANGLE,THICK),SIGMAZ(IANGLE,THICK),RMSRAD(IANGLE,THICK)    LEN11780
C                                                                       LEN11790
C     SPOT DIAGRAM ENERGY DENSITY VS. RADIUS FROM CENTROID:             LEN11800
C                                                                       LEN11810
      DO 79 IZ=1,RAYS                                                   LEN11820
        IF(FLAG(IZ) .GT. 0) GO TO 79                                    LEN11830
        SDRAD(IZ)=SQRT((YCENTR(IANGLE,THICK)-YIM(IZ))**2+ZIM(IZ)**2)    LEN11840
   79 CONTINUE                                                          LEN11850
      IZ4=1                                                             LEN11860
      RCC(IZ4)=0.005                                                    LEN11870
      SUM4(IZ4)=0.0                                                     LEN11880
   80 CONTINUE                                                          LEN11890
      DO 81 IZ=1,RAYS                                                   LEN11900
        IF(FLAG(IZ) .GT. 0) GO TO 81                                    LEN11910
        IF(SDRAD(IZ) .LE. RCC(IZ4)) SUM4(IZ4)=1+SUM4(IZ4)               LEN11920
   81 CONTINUE                                                          LEN11930
      FRACTN(IZ4)=SUM4(IZ4)/RAYS                                        LEN11940
      WRITE(6,1400) IZ4,RCC(IZ4),FRACTN(IZ4)                            LEN11950
      IZ5=IZ4                                                           LEN11960
      IZ4=IZ4+1                                                         LEN11970
      RCC(IZ4)=RCC(IZ5)+0.005                                           LEN11980
      SUM4(IZ4)=0.0                                                     LEN11990
      IF(RCC(IZ4) .GT. 0.5) GO TO 82                                    LEN12000
      GO TO 80                                                          LEN12010
   82 CONTINUE                                                          LEN12020
      IZ6=IZ4-1                                                         LEN12030
      WRITE(6,1500)                                                     LEN12040
 1300 FORMAT('1',1X,'IMAGE PLANE SPOT DIAGRAM ANALYSIS:'///1X,'THICKNESSLEN12050
     1 =',F9.7,'  U =',F9.7,'  ALFAP =',F9.7,'  R =',F9.7//1X,'CENTROID:LEN12060
     1 ZCENTR = 0.0,  YCENTR = ',F10.7//1X,'STANDARD DEVIATIONS:  SIGMAYLEN12070
     1 = ',F10.7,2X,'SIGMAZ = ',F10.7//1X,'RMS SPOT SIZE: RMSRAD = ',  LEN12080
     1F10.7///1X,'SPOT DIAGRAM ENERGY DENSITY VS. RADIUS FROM CENTROID:'LEN12090
     1//1X,' IZ4    RADIUS    FRACTION'//)                             LEN12100
 1400 FORMAT(I4,2F11.7)                                                 LEN12110
 1500 FORMAT(1X,'SPOT DIAGRAM CALCULATIONS COMPLETE.')                  LEN12120
      RETURN                                                            LEN12130
      END                                                               LEN12140
                                                                        LEN12150
      SUBROUTINE PLOTT                                                  LEN12160
      COMMON/OUT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF           LEN12170
     1,ALFAP,GFID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                        LEN12180
     2,SHAPE,SQURAY,ELLIPS,ICHECK                                       LEN12190
      COMMON/SKP/II(1010),IIP(1010),I2(1010),I2P(1010)                  LEN12200
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    LEN12210
     2,J,UP(1010),DYDXT(1010),DYDXA(1010)                               LEN12220
```

```
      COMMON/SP/K,I,IZ,IZ1,M,N,NPI,FLAG(1003),IZ4,RAYS,IZ2,IRAYS          LEN11530
     1,NUMAR,COORD,NUMB,IANGLE,THICK,IZ4,IZ5,COUNT,IZA                    LEN11540
     2,CCCR(500),NUMET,COORT,GAMMA,AP,UNP,STATNA                          LEN11550
     3,RAYY(1000),RAYZ(1000),CENI,TORAL,DOTI,TCPI                         LEN11560
     4,RADIUS,CEN,TCP,PCT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP           LEN11570
     5,AX,AY,AZ,RX,RY,RZ,AXI,AYI,AZI,PHII,PHIIP,TIRA                      LEN11580
     6,API,APJ,APK,THETA,PHI,PHIP,AO,BO,CO,DC,EC,PAR1,PAR2               LEN11590
     7,PAR3,XC,YC,ZC,NUM,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI     LEN11600
     8,ALM5,CKEP,CLPE,CAPP,D3,OPL(1000),DI,NUM6,NUM7,NTNCTY(1000)         LEN11610
     9,YIM(1000),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO          LEN11620
      COMMON/SP/NUMB,THETAI,XDIAPT(1000),YDIAPT(1000),SUM1                LEN11630
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)             LEN11640
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,500)          LEN11650
C                                                                         LEN11660
      INTEGER ELLNUM,EXUM,SHAPE,SQUARY,ELLIPS                             LEN11670
      INTEGER FLAG,RAYS,CRAYS,COORD,THICK,COUNT,COOR,COORT                LEN11680
      REAL N1,N2,N3                                                       LEN11690
      REAL II,IIP,I2,I2P                                                  LEN11700
     1,AX,AY,AZ,RX,RY,RZ,AXI,AYI,AZI,PHII,PHIIP,TIRA                      LEN11710
      REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8        LEN11720
     1,NTNCTY                                                             LEN11730
C                                                                         LEN11740
CCC   PLOT OUTPLT                                                         LEN11750
CCC                                                                       LEN11760
CCC   WRITE OUTPUT FOR PLOT INTO FILE FT01F001                            LEN11770
CCC                                                                       LEN11780
C                                                                         LEN11790
      WRITE(1,83)F,ALPHA,U,I,R,T(1),N1,N2,N3,ALPAP,GRID,STATNA,GAMMA      LEN11800
     1,RAYS,COUNT,K,IZ6,IANGLE,THICK                                      LEN11810
   83 FORMAT(' ',3F9.7,I4,4F9.7/' ',3F9.7,F9.5,F9.7/' ',6I4)              LEN11820
      DO 85 J=1,K                                                         LEN11830
         WRITE(1,84)X1(J),Y1(J),X2(J),Y2(J)                               LEN11840
   84    FORMAT(' ',4F10.7)                                               LEN11850
   85 CONTINUE                                                            LEN11860
      DO 88 IZ=1,RAYS                                                     LEN11870
         WRITE(1,86)RAYY(IZ),RAYZ(IZ),FLAG(IZ)                            LEN11880
   86    FORMAT(' ',2F10.7,3X,I1)                                         LEN11890
         IF(FLAG(IZ) .GT. 0) GO TO 88                                     LEN11900
           WRITE(1,87)YIM(IZ),ZIM(IZ)                                     LEN11910
   87      FORMAT(' ',2F10.7)                                             LEN11920
   88 CONTINUE                                                            LEN11930
      DO 90 IZ4=1,IZ6                                                     LEN11940
         WRITE(1,89)RCC(IZ4),FRACTN(IZ4)                                  LEN11950
   89    FORMAT(' ',F10.7,2X,F10.7)                                       LEN11960
   90 CONTINUE                                                            LEN11970
      WRITE(1,91)YCENTR(IANGLE,THICK),SIGMAY(IANGLE,THICK),               LEN11980
     1SIGMAZ(IANGLE,THICK),RMSRAD(IANGLE,THICK),NUMBT                     LEN11990
   91 FORMAT(' ',4F10.7,I4)                                               LEN12000
      DO 96 NUMB=1,NUMBT                                                  LEN12010
         WRITE(1,92)CCCR(NUMB)                                            LEN12020
   92    FORMAT(' ',I3)                                                   LEN12030
         COORT=COOR(NUMB)                                                 LEN12040
         DO 95 COORD=1,COORT                                              LEN12050
            WRITE(1,94)ELY(NUMB,COORD),ELZ(NUMB,COORD)                    LEN12060
   94       FORMAT(' ',F11.8,3X,F11.8)                                    LEN12070
   95    CONTINUE                                                         LEN12080
   96 CONTINUE                                                            LEN12090
      WRITE(1,97)                                                         LEN12100
   97 FORMAT(' ','/*')                                                    LEN12110
      WRITE(6,98)                                                         LEN12120
   98 FORMAT(' ','TO OBTAIN PLOTS FROM THE PLOTTER OR THE PRINTER,'/' ',  LEN12130
     1'ISSUE THE FOLLOWING COMMAND: '/' ',8X,'FOR PRINTER PLOTS',          LEN12140
     1T36,'ENTER "LENSCOM PRINTER"'/' ',8X,'FOR PLOTTER GRAPHS',T36,      LEN12150
     1'ENTER "LENSCOM PLOTTER"')                                          LEN12160
      WRITE(6,99)                                                         LEN12170
   99 FORMAT(' ','END OF PROGRAM')                                        LEN12180
      RETURN                                                              LEN12190
      END                                                                 LEN12200
```

9.1 PLOT ROUTINES

```
//AMIC3250 JOB (3250,0C89),'AMICHAI',CLASS=A                                    LEN00010
// EXEC  FRTXCLGP                                                               LEN00020
//FORT.SYSIN  DD  *                                                             LEN00030
C                                                                               LEN00040
C     SPECIFICATION STATEMENTS                                                  LEN00050
C                                                                               LEN00060
      INTEGER I,RAYS,CCUNT,IZ6,IZ4,IANGLE,THICK,IZ,NUMB,NUMBT                   LEN00070
     1,CCOR(50C),FLAG(1000),K,J,GP,GPP,COORD,COORT,ALLELL,KK,KKK,JJ             LEN00080
C                                                                               LEN00090
      REAL F,ALPHA,U,R,T(1010),N1,N2,N3,ALFAP,GRID,STATNA,GAMMA,X1(1010)LEN00100
     1,Y1(1010),X2(1010),Y2(1010),RAYY(1000),RAYZ(1000),YIM(1000)               LEN00110
     2,ZIM(1000),RCC(300),FRACTN(300),YCENTR(20,500),SIGMAY(10,500)             LEN00120
     3,SIGMAZ(10,500),RMSRAD(10,500),ELY(7,1000),ELZ(7,1000)                    LEN00130
     4,YIMAGE(1000),ZIMAGE(1000),X(2020),Y(2020)                                LEN00140
C                                                                               LEN00150
      READ(5,100)F,ALPHA,U,I,R,T(I),N1,N2,N3,ALFAP,GRID,STATNA,GAMMA            LEN00160
     1,RAYS,COLAT,K,IZ6,IANGLE,THICK,XC,DIV                                     LEN00170
  100 FORMAT(1),3F9.7,I4,4F9.7/1X,3F9.7,F9.5,F9.7/1X,6I4,2F8.5)                 LEN00180
      DO 300 J=1,K                                                              LEN00190
         READ(5,200)X1(J),Y1(J),X2(J),Y2(J)                                     LEN00200
  200    FORMAT(1X,4F10.7)                                                      LEN00210
  300 CONTINUE                                                                  LEN00220
      DO 310 J=1,K                                                              LEN00230
         X(J)=X1(J)                                                             LEN00240
         Y(J)=Y1(J)                                                             LEN00250
  310    CONTINUE                                                               LEN00260
      KK=K+1                                                                    LEN00270
      KKK=2*K                                                                   LEN00280
      DO 320 J=KK,KKK                                                           LEN00290
         JJ=J-K                                                                 LEN00300
         X(J)=X2(JJ)                                                            LEN00310
         Y(J)=Y2(JJ)                                                            LEN00320
  320 CONTINUE                                                                  LEN00330
      X(J)=STATNA                                                               LEN00340
      Y(J)=0.0                                                                  LEN00350
      J=J+1                                                                     LEN00360
      X(J)=F/R                                                                  LEN00370
      Y(J)=0.0                                                                  LEN00380
      GP=1                                                                      LEN00390
      DO 600 IZ=1,RAYS                                                          LEN00400
         READ(5,400)RAYY(IZ),RAYZ(IZ),FLAG(IZ)                                  LEN00410
  400    FORMAT(1X,2F10.7,3X,I1)                                                LEN00420
         IF(FLAG(IZ) .GT. 0) GO TO 600                                          LEN00430
           READ(5,500)YIM(IZ),ZIM(IZ)                                           LEN00440
  500      FORMAT(1X,2F10.7)                                                    LEN00450
           YIMAGE(GP)=YIM(IZ)                                                   LEN00460
           ZIMAGE(GP)=ZIM(IZ)                                                   LEN00470
           GPP=GP                                                               LEN00480
           GP=GP+1                                                              LEN00490
  600 CONTINUE                                                                  LEN00500
      DO 800 IZ4=1,IZ6                                                          LEN00510
         READ(5,700)ROC(IZ4),FRACTN(IZ4)                                        LEN00520
  700    FORMAT(1X,F10.7,2X,F10.7)                                              LEN00530
  800 CONTINUE                                                                  LEN00540
      READ(5,900)YCENTR(IANGLE,THICK),SIGMAY(IANGLE,THICK),                     LEN00550
     1SIGMAZ(IANGLE,THICK),RMSRAD(IANGLE,THICK),NUMBT                           LEN00560
  900 FORMAT(1X,4F11.7,I4)                                                      LEN00570
      ALLELL=0                                                                  LEN00580
      DO 1400 NUMB=1,NUMBT                                                      LEN00590
         READ(5,1150)CCOR(NUMB)                                                 LEN00600
 1150    FORMAT(1X,I3)                                                          LEN00610
         COORT=CCOR(NUMB)                                                       LEN00620
         ALLELL=ALLELL+COORT                                                    LEN00630
         DO 1300 COORD=1,COORT                                                  LEN00640
            READ(5,1200)ELY(NUMB,COORD),ELZ(NUMB,COORD)                         LEN00650
 1200       FORMAT(1X,F11.8,3X,F11.8)                                          LEN00660
 1300    CONTINUE                                                               LEN00670
 1400 CONTINUE                                                                  LEN00680
      WRITE(6,1500)                                                             LEN00690
 1500 FORMAT('1',' SUMMARY OF RESULTS'///)                                      LEN00700
      WRITE(6,1600) F,ALPHA,U,I,R,T(I),N1,N2,N3,ALFAP,GRID,STATNA,GAMMA,LEN00710
     1XC,DIV,RAYS,CCLAT,YCENTR(IANGLE,THICK),SIGMAY(IANGLE,THICK),              LEN00720
```

```
     1SIGMAZ(IANGLE,THICK),RMSRAD(IANGLE,THICK)                          LEN00730
 1600 FORMAT('0','FOCAL LENGTH = ',F5.7,2X,'ALPHA = ',F9.7,2X,'U = ',    LEN00740
     1F5.7,2X,'I = ',I4//'0','R = ',F9.7,2X,'T = ',F9.7,2X,'INDICES OF R LEN00750
     1EFRACTION ARE: N1 = ',F9.7,2X,'N2 = ',F9.7,2X,'N3 = ',F9.7//'0',   LEN00760
     1'ALPAP = ',F9.7,2X,'GRID = ',F9.7,2X,'STATNA = ',F9.5,2X,'GAMMA = ' LEN00770
     1',F9.7,2X,'XC=',F7.5,2X,'DIV=',F7.5,                               LEN00780
     1//'0','RAYS = ',I4,2X,'COUNT = ',I4,2X,'YCENTR = ',F10.7,          LEN00790
     12X,'SIGMAY =',F10.7,2X,'SIGMAZ =',F10.7//'0','RMSRAD =',F10.7)     LEN00800
      WRITE(6,1700)                                                      LEN00810
 1700 FORMAT('1',48X,'GLM LENS SHAPE'/)                                  LEN00820
      CALL PLOTP(X,Y,J,4)                                                LEN00830
      WRITE(6,1800)                                                      LEN00840
 1800 FORMAT('1',48X,'OBJECT PLANE'/)                                    LEN00850
      ALLELL=2*ALLELL+ALLELL/2                                           LEN00860
      CALL PLOTP(ELZ,ELY,ALLELL,4)                                       LEN00870
      WRITE(6,1500)                                                      LEN00880
 1500 FORMAT('1',48X,'IMAGE PLANE'/)                                     LEN00890
      CALL PLOTP(ZIMAGE,YIMAGE,GPP,4)                                    LEN00900
      WRITE(6,2000)                                                      LEN00910
 2000 FORMAT('1',36X,'ENERGY DENSITY VS. RADIUS FROM CENTROID'/)         LEN00920
      CALL PLOTP(ROC,FRACTN,126,4)                                       LEN00930
      STOP                                                               LEN00940
      END                                                                LEN00950
/*                                                                       LEN00960
//GO.SYSIN  DD  *                                                       LEN00970
```

```
&CONTROL ERROR
&IF .&1 EQ .PRINTER &GOTO -PRINTER
&IF .&1 EQ .PLOTTER &GOTO -PLOTTER
&TYPE REPEAT. SPECIFY PRINTER OR PLOTTER.
&EXIT
-PRINTER &CONTINUE
&NAME = LEASPLOT
&GOTO -CC
-PLOTTER &CONTINUE
&NAME = LEASGRAF
-CC &CONTINUE
COPYFILE &NAME FORTRAN A FILE FT01F001 A PLOT FORTRAN A (REPLACE
EXEC SUBMIT PLOT FORTRAN
```

10. PROGRAM GRIN - LISTING

```
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C                          PROGRAM GRIN
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      COMMON/CT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF
     1,ALFAP,GFIC,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE
      COMMON/P1/SHAPE,SQURAY,ELLIPS,ICHECK
      COMMON/SHP/I1(1010),I1P(1010),I2(1010),I2P(1010)
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)
        COMMON/IN/AN2,BN2,XC,DIV,E,THETAE,RO
        COMMON/GN/RR(1010),RF(1010),THETAO,TOTF,PSI,PSIO
        COMMON/RA/BR1,BR2
        COMMON/DET/A1,A2,A3,B1,B2,B3,C1,C2,C3
        COMMON/DIR/RRX,RRY,RRZ,NPFX,NPFY,NPFZ,PSIR
        COMMON/RN2/PRF,PF1
        COMMON/IT/ILCOP
      COMMON/SK/K,L,IZ,IZ1,M,N,NP1,FLAG(1010),IZ0,RAYS,IZ2,DRAYS
     1,NUMBR,COORD,NUMB,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6
     2,CCCR(500),NUMET,COORT,GAMMA,AB,UNP,STATNA
     3,RAYY(1010),RAYZ(1010),CENI,TORBI,ROTI,TCPI
     4,RADIUS,CEN,TCP,BCT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA
     6,NPI,NPJ,NPK,THETA,PHI,PHIP,AO,BO,CO,DC,EC,PAR1,PAR2
     7,PAR3,XC,YO,ZC,NUM,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI
     8,NUM5,CKPP,CLPP,CMPP,D3,DPL(1010),D1,NUM6,NUM7,NTNCTY(1010)
     9,YIM(1010),ZIM(1010),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO
      COMMON/SM/NUMB,THETAI,XCIAPT(1010),YCIAPT(1010),SUM1
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1010),YCENTR(20,500)
C
       INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS
       INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT
       REAL N1,N2,N3
       REAL I1,I1P,I2,I2P
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA
       REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8
     1,NTNCTY
       REAL NPFX,NPFY,NPFZ
C
       CALL DATTA
       ICHECK=0
       K=I+1
       DO 10 J=1,K
       IF(J.GT.1)BETA(J)=BETA(1)-(J-1)*DLB
       IF(ICASE.EQ.1)CALL SHAPEC
       IF(ICASE.EQ.2)CALL SHAPET
       IF(J.GT.1)GO TO 5
       CLB=BETA(1)/I
       WRITE(6,100) ICASE,ALPHA,BETA(1),R,U,I,T(1),N1,N2,N3,BF,DLB
     1              ,XC,DIV,ALFAP
 5       IF(SHAPE.EQ.0)GO TO 10
         WRITE(6,200)J,X1(J),Y1(J),X2(J),Y2(J),BETA(J),I2P(J),I2(J),
     1   ETA(J),T(J),I1P(J),I1(J),DYDXT(J)
     2   ,E,THETAE,THETAO,PSI,PSIO,RR(J),RF(J)
 10 CONTINUE
         CALL NOSE
 20 CALL ZOYC
         IF(ICASE.GT.1)GO TO 25
         CALL FACI
         IF(ICHECK.EQ.20)GO TO 20
         IF(ICHECK.EQ.40)CALL SKEWC
         IF(ICHECK.EQ.60)GO TO 60
         GO TO 50
 25 CALL SKEWT
         IF(ICHECK.EQ.20)GO TO 20
         IF(ICHECK.EQ.60)GO TO 60
 50 CALL INTENS
         IF(ICHECK.EQ.30)GO TO 20
         STOP
 60 CALL IMAGE
```

```
      CALL SUMM                                                          GRI00730
      CALL PLOTT                                                         GRI00740
  100 FORMAT('0',' GRIN PARAMETERS(',I1,'):'///5X,'ALPHA = ',F9.7,2X,GRI00750
     1'BETA = ',F9.7,2X,'RADIUS = ',F7.5,2X,'INCIDENT ANGLE = ',       GRI00760
     2F5.6,2X,'ITERATIONS = ',I5//5X,'EDGE THICKNESS = ',F9.7,2X,      GRI00770
     3'INDICES OF REFRACTION: N1 = ',F7.5,2X,'N2 = ',F7.5,2X,'N3 = ',  GRI00780
     4F7.5//5X,'FOCAL LENGTH FROM STATION ZERO = ',F7.5,2X,            GRI00790
     5'DELTA BETA= ',F7.5//5X,'CENTER OF SYM(XC)=',F8.5,2X,            GRI00800
     6'CHANGE IN N2(1)=',F6.3,2X,'ALFAP=',F6.3//5X,                    GRI00810
     7'NOTE:X-COORDINATES HAS BEEN SHIFTED IN CASE=2 BY X2(K);NOW,X2(K)=GRI00820
     80.0 ETC.'///                                                     GRI00830
     1X,' J X1 Y1 X2 Y2 BETA I2PGRI00840
     2 I2 ETA T I1P I1 DYDXT'/ GRI00850
     3,7X,'E',5X,'THETAE',4X,'THETAO',4X,'PSI',7X,'PSIO',6X,           GRI00860
     4'RR',8X,'RF'//)                                                  GRI00870
  200 FORMAT(1X,I4,I2F10.7/5X,7F10.7)                                   GRI00880
      STOP                                                              GRI00890
      END                                                               GRI00900
                                                                        GRI00910
      SUBROUTINE DATTA                                                  GRI00920
        COMMON/ET/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF          GRI00930
     1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                        GRI00940
        COMMON/P1/SHAPE,SQURAY,ELLIPS,ICHECK                            GRI00950
        COMMON/SHP/I1(1010),I1P(1010),I2(1010),I2P(1010)                GRI00960
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    GRI00970
     2,J,UP(10C0),DYDXT(1010),DYDXN(1010)                               GRI00980
        COMMON/IN/AN2,BN2,XC,CIV,E,THETAE,RO                            GRI00990
        COMMON/SK/K,L,IZ,IZ1,M,N,NP1,FLAG(1010),IZO,RAYS,IZ2,DRAYS      GRI01000
     1,KLMBP,CCORD,KLMP,IANGLE,THICK,IZ4,IZ5,CCUNT,IZ6                  GRI01010
     2,CCOR(500),NUMBT,COORT,GAMMA,AB,ONP,STATNA                        GRI01020
     3,RAYY(1010),RAYZ(1010),CENI,TORBT,BOTI,TOPI                       GRI01030
     4,RADIUS,CEN,TOP,CCT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         GRI01040
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    GRI01050
     6,API,NPJ,APK,THETA,PHI,PHIP,AO,BO,CO,DO,EO,PAR1,PAR2              GRI01060
     7,PAR3,XC,YO,ZC,KLM,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI    GRI01070
     8,NUM5,CKEF,CLPF,CMPP,D3,OPL(1010),DI,NUM6,NUM7,NTNCTY(1010)       GRI01080
     9,YIM(1010),ZIM(1010),FIL,FLY(7,1000),ELZ(7,1000),ELZZ,ZOYO        GRI01090
        COMMON/SM/NUME,THETAI,XOIAPT(1010),YOIAPT(1010),SUM1            GRI01100
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)           GRI01110
     2,RLC(30C),SUM4(300),FRACTN(300),SDRAD(1010),YCENTR(20,500)        GRI01120
C                                                                       GRI01130
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                           GRI01140
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,CCUNT,COOR,CCORT              GRI01150
      REAL N1,N2,N3                                                     GRI01160
      REAL I1,I1P,I2,I2P                                                GRI01170
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    GRI01180
      REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8      GRI01190
     1,NTNCTY                                                           GRI01200
C                                                                       GRI01210
C     F IS THE FOCAL LENGTH                                             GRI01220
C     ALPHA IS THE INSIDE SURFACE CONE HALF ANGLE                       GRI01230
C        (ALFA IS IN DEG.,ALPHA IS IN RAD.)                             GRI01240
C     U IS THE INCIDENT RAY OFFSET ANGLE                                GRI01250
C     ICASE CHOOSES WHETHER THE CONE IS THE FRONT SURFACE(1,ICASE=1)    GRI01260
C                                   OR THE REAR SURFACE(0,ICASE=2)      GRI01270
C     I IS THE NUMBER OF ITERATIONS(MUST BE AN EVEN INTEGER)            GRI01280
C     R IS THE MAXIMUM RADIUS OF INSIDE SURFACE CONE                    GRI01290
C     T IS THE THICKNESS OF LENS AT THE EDGE                            GRI01300
C     N1,N2,N3 ARE THE INDICES OF REFRACTIONS                           GRI01310
    1 READ (5,*) F,ALFA,U,ICASE                                         GRI01320
    2 READ (5,*) I,R,T(1)                                               GRI01330
    3 READ (5,*) N1,N2,N3                                               GRI01340
      T(1)=T(1)/R                                                       GRI01350
      PI=ATAN(1.0)*4.0                                                  GRI01360
      RAD=PI/180.0                                                      GRI01370
      ALPHA=ALFA*RAD                                                    GRI01380
C                                                                       GRI01390
C     INPUT KNOWNS FOR TRACE RAY:                                       GRI01400
C     ALFAP IS THE INCLINATION OF OBJECT PLANE(RADIANS)                 GRI01410
C     GRID IS THE SIZE OF GRID INCREMENT                                GRI01420
C     ELLNUM :  THE NUMBER OF ELLIPSES=ENUM;ELLNUM MUST BE EVEN         GRI01430
C               AND I/ELLNUM MUST BE AN INTEGER WITH NO REMAINDER       GRI01440
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C       ELL IS THE Z COORDINATE INCREMENT FOR ELLIPSE PLOTS                GRI01450
    4   READ (5,*) ALFAP,GRID,ELLNUM                                      GRI01460
        ENUM=ELLNUM+1                                                      GRI01470
        ELL=GRID/5.0                                                       GRI01480
        BF=F/R                                                             GRI01490
C                                                                          GRI01500
C           INPUT FOR GRIN                                                 GRI01510
C           XC IS THE LOCATION OF CENTER,DIV IS THE CHANGE IN N2(8)        GRI01520
    5       READ (5,*) XC,DIV                                              GRI01530
            AN2=N2**2                                                      GRI01540
            BN2=AN2*((1.0+DIV)**2-1.0)                                     GRI01550
            IF(XC.GE.(-.01)GO TO 10                                        GRI01560
C                                                                          GRI01570
C       OUTPUT OPTIONS:                                                    GRI01580
C       TO HAVE LENS SHAPE DATA PRINTED SET "SHAPE" TO 1. OTHERWISE        GRI01590
C       SET "SHAPE"=0                                                      GRI01600
C       TO HAVE SKEW RAY AND MIRROR IMAGE SKEW RAY DATA OUTPUT SET         GRI01610
C       "SQURAY" TO 1. ELSE SET "SQURAY" TO 0. (INTEGER)                   GRI01620
C       "SQURAY",EG.2 OR 3 GIVES DIFFERENT PRINTS FOR ANALYSIS.            GRI01630
C       TO HAVE ELLIPSE SHAPE DATA PRINTED SET "ELLIPS" TO 1. OTHERWISE    GRI01640
C       SET "ELLIPS" = 0                                                   GRI01650
    6   READ (5,*) SHAPE,SQURAY,ELLIPS                                    GRI01660
        RETURN                                                             GRI01670
   10   WRITE(6,20)                                                        GRI01680
   20   FORMAT(5X,'SORRY;TAKE XC.LT.0.0')                                  GRI01690
        STOP                                                               GRI01700
        END                                                                GRI01710
                                                                           GRI01720
        SUBROUTINE SHAPEC                                                  GRI01730
C       WILL BE ADDED IN CAPT. CARR'S THESIS                               GRI01740
        STOP                                                               GRI01750
        END                                                                GRI01760
                                                                           GRI01770
        SUBROUTINE SHAPET                                                  GRI01780
         COMMON/CT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            GRI01790
       1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                         GRI01800
        COMMON/PT/SHAPE,SQURAY,ELLIPS,ICHECK                               GRI01810
         COMMON/SHP/I1(1010),I1P(1010),I2(1010),I2P(1010)                  GRI01820
       1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                     GRI01830
       2,J,UP(1010),DYDXT(1010),DYDXN(1010)                                GRI01840
          COMMON/IN/AN2,BN2,XC,DIV,E,THETAE,PO                             GRI01850
          COMMON/GN/RR(1010),RF(1010),THETA0,TOTE,PSI,PSI0                 GRI01860
          COMMON/FA/B1,B2                                                  GRI01870
        REAL N1,N2,N3                                                      GRI01880
        REAL I1,I1P,I2,I2P                                                 GRI01890
       1,NX,NY,NZ,PX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                     GRI01900
C                                                                          GRI01910
        IF(J.GT.1)GO TO 13                                                 GRI01920
        CALL INIT                                                          GRI01930
        GO TO 15                                                           GRI01940
C       ASSUME THETAE(J)=THETAE(J-1)                                       GRI01950
   13   THETAE=THETAE*1.005                                                GRI01960
        KITER=0                                                            GRI01970
   15   CALL POINTS                                                        GRI01980
        CALL FOCAL                                                         GRI01990
C       ITERATION ROUTINE TO FIND CORRECT THETAE                           GRI02000
        IF(KITER.EQ.0)CALL ITER                                            GRI02010
        IF(KITER.EQ.1)GO TO 17                                             GRI02020
        KITER=1                                                            GRI02030
        GO TO 15                                                           GRI02040
C       SLOPES OF NORMAL AND TANGENTIAL(SURFACE)                           GRI02050
   17   CALL INDEX(RR(J),RF(J),N2)                                         GRI02060
        PSI0=ARSIN(E/(N2*RR(J)))                                           GRI02070
        CALL REAR                                                          GRI02080
   19   DYDXT(J)=COTAN(ETA(J))                                             GRI02090
        DYDXN(J)=-TAN(ETA(J))                                              GRI02100
        RETURN                                                             GRI02110
        END                                                                GRI02120
                                                                           GRI02130
        SUBROUTINE INIT                                                    GRI02140
         COMMON/CT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            GRI02150
       1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                         GRI02160
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      COMMON/PI/SHAPE,SCURAY,ELLIPS,ICHECK                              GRI02170
       COMMON/SHP/II(1010),IIP(1010),I2(1010),I2P(1010)                 GRI02180
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    GRI02190
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               GRI02200
       COMMON/IN/AN2,EN2,XC,DIV,E,THETAE,RO                             GRI02210
       COMMON/GN/RR(1010),RF(1010),THETAO,TOTE,PSI,PSIO                 GRI02220
       COMMON/RA/R1,R2                                                  GRI02230
C                                                                       GRI02240
      REAL N1,N2,N3                                                     GRI02250
      REAL II,IIP,I2,I2P                                                GRI02260
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    GRI02270
C                                                                       GRI02280
      Y1(1)=R                                                           GRI02290
      X1(1)=R/TAN(ALPHA)                                                GRI02300
        IF(X1(1).NE.XC)GO TO 15                                         GRI02310
        TOTE=PI/2.0                                                     GRI02320
        GO TO 17                                                        GRI02330
   15 TOTE=ATAN(R/(X1(1)-XC))                                           GRI02340
   17 RF(1)=R/SIN(TOTE)                                                 GRI02350
      THETAE=T(1)/RF(1)                                                 GRI02360
      THETAO=TOTE-THETAE                                                GRI02370
        RO=RF(1)                                                        GRI02380
C       THIS WILL FIX RO=CONSTANT THROUGH THAT RUN.                     GRI02390
      CALL FRONT                                                        GRI02400
      CALL RADAR(RR(1),RF(1),-1.0)                                      GRI02410
      CALL INDEX(RR(1),RF(1),N2)                                        GRI02420
      PSIO=ARSIN(E/(N2*RR(1)))                                          GRI02430
      Y2(1)=RR(1)*SIN(THETAO)                                           GRI02440
      X2(1)=XC+RR(1)*COS(THETAO)                                        GRI02450
      BETA(1)=ATAN(Y2(1)/(DF-X2(1)))                                    GRI02460
      CALL REAF                                                         GRI02470
      RETURN                                                            GRI02480
      END                                                               GRI02490
                                                                        GRI02500
      SUBROUTINE POINTS                                                 GRI02510
       COMMON/CT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF           GRI02520
     1,ALFAP,GFID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                        GRI02530
       COMMON/PI/SHAPE,SCURAY,ELLIPS,ICHECK                             GRI02540
       COMMON/SHP/II(1010),IIP(1010),I2(1010),I2P(1010)                 GRI02550
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    GRI02560
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               GRI02570
       COMMON/IN/AN2,EN2,XC,DIV,E,THETAE,RO                             GRI02580
       COMMON/GN/RR(1010),RF(1010),THETAO,TOTE,PSI,PSIO                 GRI02590
C                                                                       GRI02600
      REAL N1,N2,N3                                                     GRI02610
      REAL II,IIP,I2,I2P                                                GRI02620
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    GRI02630
C                                                                       GRI02640
      BPF=Y2(J-1)*(-DYDXN(J-1)+COTAN(BETA(J-1)))                        GRI02650
      X2(J)=(BPF*(TAN(BETA(J))*DYDXT(J-1))-DYDXT(J-1)*BPF)              GRI02660
     1/(DYDXT(J-1)+TAN(BETA(J)))                                        GRI02670
      Y2(J)=TAN(BETA(J))*(-X2(J)+BF)                                    GRI02680
      RR(J)=SQRT((X2(J)-XC)**2+Y2(J)**2)                                GRI02690
        IF(X2(J).NE.XC)GO TO 15                                         GRI02700
        THETAO=PI/2.0                                                   GRI02710
        GO TO 17                                                        GRI02720
   15 THETAO=ATAN(Y2(J)/(X2(J)-XC))                                     GRI02730
   17 TOTE=THETAE+THETAO                                                GRI02740
      X1(J)=(XC*TAN(TOTE))/(TAN(TOTE)-TAN(ALPHA))                       GRI02750
      Y1(J)=X1(J)*TAN(ALPHA)                                            GRI02760
      RF(J)=Y1(J)/SIN(TOTE)                                             GRI02770
      T(J)=SQRT((X2(J)-X1(J))**2+(Y1(J)-Y2(J))**2)                      GRI02780
      RETURN                                                            GRI02790
      END                                                               GRI02800
                                                                        GRI02810
      SUBROUTINE FRONT                                                  GRI02820
       COMMON/CT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF           GRI02830
     1,ALFAP,GFID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                        GRI02840
       COMMON/PI/SHAPE,SCURAY,ELLIPS,ICHECK                             GRI02850
       COMMON/SHP/II(1010),IIP(1010),I2(1010),I2P(1010)                 GRI02860
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    GRI02870
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               GRI02880
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      COMMON/IN/AN2,BN2,XC,DIV,E,THETAE,RO                              GRID02890
      COMMON/GN/RR(1010),RF(1010),THETAO,TOTE,PSI,PSIO                  GRID02900
C                                                                       GRID02910
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                           GRID02920
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,CCUNT,COOR,COORT              GRID02930
      REAL N1,N2,N3                                                     GRID02940
      REAL II,IIP,I2,I2P                                                GRID02950
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    GRID02960
C                                                                       GRID02970
      III(J)=PI/2.0-ALPHA-U                                             GRID02980
      CALL INDEX(RF(J),RF(J),N2)                                        GRID02990
C     COMPUTES N2 AT RF(J)                                              GRID03000
      IIP(J)=ARSIN(N2/N2*SIN(III(J)))                                   GRID03010
      DELTA=TOTE-ALPHA                                                  GRID03020
      PSI=PI/2.0+IIP(J)-DELTA                                           GRID03030
      E=N2*RF(J)*SIN(PSI)                                               GRID03040
      RETURN                                                            GRID03050
      END                                                               GRID03060
                                                                        GRID03070
      SUBROUTINE REAR                                                   GRID03080
      COMMON/CT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            GRID03090
     1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                        GRID03100
      COMMON/PT/SHAPE,SQURAY,ELLIPS,ICHECK                              GRID03110
      COMMON/SHP/II(1010),IIP(1010),I2(1010),I2P(1010)                  GRID03120
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    GRID03130
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               GRID03140
      COMMON/IN/AN2,BN2,XC,DIV,E,THETAE,RO                              GRID03150
      COMMON/GN/RR(1010),RF(1010),THETAO,TOTE,PSI,PSIO                  GRID03160
C                                                                       GRID03170
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                           GRID03180
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,CCUNT,COOR,COORT              GRID03190
      REAL N1,N2,N3                                                     GRID03200
      REAL II,IIP,I2,I2P                                                GRID03210
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    GRID03220
C                                                                       GRID03230
      PSIO=PI-PSIO                                                      GRID03240
      DELP=PI-THETAO-PSIO                                               GRID03250
      A=(N3/N2*COS(BETA(J))-COS(DELP))/(N3/N2*SIN(BETA(J))-SIN(DELP))   GRID03260
      X=SQRT(1.0/(1.0+A**2))                                            GRID03270
      ETA(J)=ARSIN(X)                                                   GRID03280
      I2(J)=DELP-ETA(J)                                                 GRID03290
      I2P(J)=BETA(J)-ETA(J)                                             GRID03300
      RETURN                                                            GRID03310
      END                                                               GRID03320
                                                                        GRID03330
      SUBROUTINE NOSE                                                   GRID03340
      COMMON/CT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            GRID03350
     1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                        GRID03360
      COMMON/PT/SHAPE,SQURAY,ELLIPS,ICHECK                              GRID03370
      COMMON/IN/AN2,BN2,XC,DIV,E,THETAE,RO                              GRID03380
      COMMON/SHP/II(1010),IIP(1010),I2(1010),I2P(1010)                  GRID03390
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    GRID03400
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               GRID03410
      COMMON/SK/K,L,IZ,IZ1,M,N,NP1,FLAG(1010),IZ0,RAYS,IZ2,DRAYS        GRID03420
     1,NUMBR,COORD,NUME,IANGLE,THICK,IZ4,IZ5,CCUNT,IZ6                  GRID03430
     2,COOR(500),NUMPT,COORT,GAMMA,AE,ONP,STATNA                        GRID03440
     3,RAYY(1010),RAYZ(1010),CENI,TOPBI,BOTI,TOPI                       GRID03450
     4,RADIUS,CEN,TCE,PCT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         GRID03460
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    GRID03470
     6,NFI,NPJ,NPK,THETA,PHI,PHIP,A0,B0,C0,DC,E0,PAR1,PAR2              GRID03480
     7,PAR3,XC,YO,ZO,NUM,CKP,CLP,CNP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI    GRID03490
     8,NUM5,CKPP,CLPP,CNPP,D3,DPL(1010),DI,NUM6,NUM7,NTRCTY(1010)       GRID03500
     9,YIM(1010),ZIM(1010),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO        GRID03510
      COMMON/SM/NLMB,THETAI,XOIAPT(1010),YOIAPT(1010),SUM1              GRID03520
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)           GRID03530
     2,ROC(300),SUM4(300),FRACTN(300),SQRAD(1010),YCENTR(20,500)        GRID03540
C                                                                       GRID03550
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                           GRID03560
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,CCUNT,COOR,COORT              GRID03570
      REAL N1,N2,N3                                                     GRID03580
      REAL II,IIP,I2,I2P                                                GRID03590
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    GRID03600
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      REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8      GRI03610
     1,NTNCTY                                                           GRI03620
C                                                                       GRI03630
C    OPAQUE NOSE SECTION FOLLOWS                                        GRI03640
C                                                                       GRI03650
          GO TO (1,2),ICASE                                             GRI03660
    1     AB=(-X1(J-1))+(Y1(J-1))/DYDXT(J-1)                            GRI03670
          STATNA=-AB                                                    GRI03680
          GAMMA=ATAN(DYDXT(J-1))                                        GRI03690
          ONP=(Y1(J-1))/SIN(GAMMA)                                      GRI03700
          IF(SHAPE.EQ.1)WRITE(6,300)GAMMA,STATNA,ONP                    GRI03710
          GO TO 90                                                      GRI03720
    2     AB=+X2(K)                                                     GRI03730
          BF=BF-AB                                                      GRI03740
          XC=XC-AB                                                      GRI03750
          DO 10 J=1,K                                                   GRI03760
          X1(J)=X1(J)-AB                                                GRI03770
   10     X2(J)=X2(J)-AB                                                GRI03780
          WRITE(6,400)AB,X2(1),BF,XC                                    GRI03790
          GO TO 90                                                      GRI03800
  300 FORMAT('0',1X,'OPAQUE NOSE SECTION:'//1X,'NOSE HALF ANGLE = ',    GRI03810
     1F7.5,2X,'STATION A = ',F9.5,2X,'SURFACE LENGTH = ',F7.5////)      GRI03820
  400 FORMAT(2X,4F9.5)                                                  GRI03830
   90 RETURN                                                            GRI03840
      END                                                               GRI03850
C                                                                       GRI03860
      SUBROUTINE ZOYO                                                   GRI03870
      COMMON/CT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            GRI03880
     1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                        GRI03890
      COMMON/PT/SHAPE,SQURAY,ELLIPS,ICHECK                              GRI03900
       COMMON/SHP/I1(1010),I1P(1010),I2(1010),I2P(1010)                 GRI03910
     1,ETA(101C),X1(1010),Y1(1010),X2(1010),Y2(1010)                    GRI03920
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               GRI03930
       COMMON/SK/K,L,IZ,IZI,M,N,NP1,FLAG(101C),IZO,RAYS,IZ2,DRAYS       GRI03940
     1,NUMBR,COORD,NUMB,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                  GRI03950
     2,CCOP(500),NUMBT,COORT,GAMMA,AB,ONP,STATNA                        GRI03960
     3,RAYY(1010),RAYZ(1010),CENI,TORBI,BOTI,TOPI                       GRI03970
     4,RADIUS,CEN,TCF,FCT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         GRI03980
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                   GRI03990
     6,API,NPJ,NPK,THETA,PPI,PHIP,A0,B0,C0,CC,F0,PAR1,PAR2             GRI04000
     7,PAR3,XC,YO,ZC,NLP,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI   GRI04010
     8,NUM5,CKPP,CLPP,CMPP,D3,OPL(1010),DL,NUM6,NUM7,NTNCTY(1010)       GRI04020
     9,YIM(101C),ZIM(1010),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO        GRI04030
       COMMON/SM/NUME,THETAI,XDIAPT(1010),YDIAPT(1010),SUM1             GRI04040
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)           GRI04050
     2,REC(300),SUM4(300),FRACTN(300),SORAD(1010),YCENTR(20,500)        GRI04060
C                                                                       GRI04070
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                           GRI04080
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOP,COOPT              GRI04090
      REAL N1,N2,N3                                                     GRI04100
      REAL I1,I1P,I2,I2P                                                GRI04110
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                   GRI04120
      REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8      GRI04130
     1,NTNCTY                                                           GRI04140
C                                                                       GRI04150
C    ALGORITHM TRACE RAY (SEE INPUTS: X1(J),Y1(J),DYDXN(J),X2(J))      GRI04160
      IF(ICHECK.EQ.20)GO TO 20                                          GRI04170
      IF(ICHECK.EQ.30)GO TO 30                                          GRI04180
      IZ=1                                                              GRI04190
      COUNT=0                                                           GRI04200
      RAYY(IZ)=0.0                                                      GRI04210
      RAYZ(IZ)=0.0                                                      GRI04220
      NTNCTY(IZ)=1.0                                                    GRI04230
      IF(SQURAY .EQ. 1) WRITE(6,400) ALFAP,GRID                         GRI04240
   20 ICHECK=0                                                          GRI04250
      IF(RAYZ(IZ) .GE. Y1(K)) GO TO 30                                  GRI04260
        CENI=(RP+X1(K))*SIN(ALFAP)                                      GRI04270
        TORBI=SQRT(Y1(K)**2-RAYZ(IZ)**2)                                GRI04280
        BOTI=CENI-TORBI                                                 GRI04290
        IF(RAYY(IZ) .LE. BOTI) GO TO 30                                 GRI04300
          TOPI=CENI+TORBI                                               GRI04310
          IF(RAYY(IZ) .GE. TOPI) GO TO 31                               GRI04320
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            RAYZ(IZ)=RAYZ(IZ)+GRID                                    GRID04310
            GO TO 20                                                  GRID04320
   30 ICHECK=0                                                        GRID04330
C  SEARCH FOR Y1(J) JUST GT RAYZ(IZ); RETRIEVE X1(J)                  GRID04340
      N=K/2                                                           GRID04350
      IF(Y1(N) .LT. RAYZ(IZ)) GO TO 32                                GRID04360
        IF(RAYY(IZ) .GT. 1.15) GO TO 32                               GRID04370
          N=K-1                                                       GRID04380
   31 CONTINUE                                                        GRID04390
      IF(Y1(N) .GT. RAYZ(IZ)) GO TO 36                                GRID04400
        N=N-1                                                         GRID04410
        IF(N .EQ. 0) GO TO 34                                         GRID04420
        GO TO 31                                                      GRID04430
   32 CONTINUE                                                        GRID04440
      N=N                                                             GRID04450
   33 CONTINUE                                                        GRID04460
      IF(Y1(N) .GT. RAYZ(IZ)) GO TO 36                                GRID04470
        N=N-1                                                         GRID04480
        IF(N .EQ. 0) GO TO 34                                         GRID04490
        GO TO 33                                                      GRID04500
   34 CONTINUE                                                        GRID04510
      RAYZ(IZ)=0.0                                                    GRID04520
      IF(RAYY(IZ) .LT. 0.0) GO TO 35                                  GRID04530
        RAYY(IZ)=RAYY(IZ)+GRID                                        GRID04540
        GO TO 20                                                      GRID04550
   35 CONTINUE                                                        GRID04560
      RAYY(IZ)=RAYY(IZ)-GRID                                          GRID04570
      GO TO 20                                                        GRID04580
  400 FORMAT('1',' SKEW RAY TRACE PARAMETERS:'///5X,'ALFAP= ',F9.7,2X,GRID04590
     1'GRID= ',F9.7,2X,'SEE LENS PARAMETERS ABOVE.'///2X,'RAY',2X,    GRID04600
     2'RAYY',4X,'RAYZ',4X,'XO',6X,'YO',6X,'XI',6X,'YI',6X,'ZI',6X,    GRID04610
     3'GPL',5X,'YIM',5X,'ZIM',5X,'INTNCTY',2X,'XDIAPT',4X,'YDIAPT'    GRID04620
     4/7X,'PHII',4X,'PHIIP',3X,'CKPP',4X,'CLPP',4X,'CMPP',4X,         GRID04630
     5'D3',6X,'D1',6X,'NUM6',4X,'NUM7',4X,'NUM8'//)                   GRID04640
   36 RETURN                                                          GRID04650
      END                                                             GRID04660
                                                                      GRID04670
      SUBROUTINE RADI                                                 GRID04680
      COMMON/ET/E,ALPEA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BE          GRID04690
     1,ALFAP,GRID,ELLNUP,ENUM,ELLBE,PI,RAD,ICASE                      GRID04700
      COMMON/PT/SHAPE,SQURAY,ELLIPS,ICHECK                            GRID04710
      COMMON/SHP/I1(1010),IIP(1010),I2(1010),I2P(1010)                GRID04720
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                  GRID04730
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                             GRID04740
      COMMON/SK/K,L,IZ,IZI,M,N,NP1,FLAG(1010),IZO,RAYS,IZ2,DRAYS      GRID04750
     1,NUMOR,COORD,NUMB,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                GRID04760
     2,COOR(500),NUMBT,COORT,GAMMA,AB,OMP,STAINA                      GRID04770
     3,RAYY(1010),RAYZ(1010),CENI,TORBI,BOTI,TOPI                     GRID04780
     4,RADIUS,CEN,TOP,PET,TORB,DELTAX,DELTAY,SP,STRATIO,DYDXNP        GRID04790
     5,AX,AY,AZ,RX,RY,RZ,AXI,AYI,AZI,PHII,PHIIP,TIRA                  GRID04800
     6,API,APJ,APK,THETA,PHI,PHIP,AO,BO,CO,DO,EO,PAR1,PAR2            GRID04810
     7,PAR3,XC,YC,ZC,NUM,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI  GRID04820
     8,NUM5,CKPP,CLPP,CMPP,D3,OPL(1010),DL,NUM6,NUM7,NTNCTY(1010)     GRID04830
     9,YIM(1010),ZIM(1010),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO      GRID04840
      COMMON/SM/NUMB,THETAI,XDIAPT(1010),YDIAPT(1010),SUM1             GRID04850
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)         GRID04860
     2,RCC(1010),SUM4(300),FRACTN(300),SUMAB(1010),YCENTR(20,501)     GRID04870
C                                                                     GRID04880
      INTEGER ELLNUP,ENUM,SHAPE,SQURAY,ELLIPS                         GRID04890
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT            GRID04900
      REAL N1,N2,N3                                                   GRID04910
      REAL I1,IIP,I2,I2P                                              GRID04920
     1,AX,AY,AZ,RX,RY,RZ,AXI,AYI,AZI,PHII,PHIIP,TIRA                  GRID04930
      REAL NPI,APJ,APK,AUP,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8    GRID04940
     1,NTNCTY                                                         GRID04950
C                                                                     GRID04960
   36    GO TO (361,362),ICASE                                        GRID04970
  361    YRN=Y1(K)                                                    GRID04980
         YR1=Y1(1)                                                    GRID04990
      RADIUS=SQRT(RAYZ(IZ)**2+((RAYY(IZ)/COS(ALFAP))-(X1(N)+AB)*      GRID05000
     1TAN(ALFAP))**2)                                                 GRID05010
         GO TO 363                                                    GRID05020
                                                                      GRID05030
                                                                      GRID05040
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  362     YRN=Y2(N)                                                      GRID5050
          YR1=Y2(1)                                                      GRID5060
C     RADIUS IS DEFINED IN SKEWT                                         GRID5070
  363 IF(YRN .GT. RADIUS) GO TO 40                                       GRID5080
        IF(RADIUS .GT.YR1) GO TO 37                                      GRID5090
        N=N-1                                                            GRID5100
        GO TO 36                                                         GRID5110
   37 CONTINUE                                                           GRID5120
      N=N-1                                                              GRID5130
      IF(N .GT. 0) GO TO 36                                              GRID5140
      CEN=(X1(1)+AB)*SIN(ALFAP)                                          GRID5150
      TORB=Y1(1)*COS(ALFAP)                                              GRID5160
      RAYZ(IZ)=0.0                                                       GRID5170
      IF(RAYY(IZ) .GE. 0.0) GO TO 38                                     GRID5180
        RAYY(IZ)=RAYY(IZ)-GRID                                           GRID5190
        BOT=CEN-TORB                                                     GRID5200
C       CHECK FOR BOTTOM EDGE OF LENS, GO TO MIRROR IMAGE RAYS           GRID5210
        IF(RAYY(IZ) .LT. BOT) ICHECK=60                                  GRID5220
        IF(RAYY(IZ) .GE. BOT) ICHECK=20                                  GRID5230
        RETURN                                                           GRID5240
   38 CONTINUE                                                           GRID5250
      RAYY(IZ)=RAYY(IZ)+GRID                                             GRID5260
      TOP=CEN+TORB                                                       GRID5270
      IF(RAYY(IZ) .GT. TOP) GO TO 39                                     GRID5280
        ICHECK=20                                                        GRID5290
        RETURN                                                           GRID5300
   39 CONTINUE                                                           GRID5310
      RAYY(IZ)=-GRID                                                     GRID5320
      ICHECK=20                                                          GRID5330
      RETURN                                                             GRID5340
   40 ICHECK=40                                                          GRID5350
      RETURN                                                             GRID5360
      END                                                                GRID5370
                                                                         GRID5380
      SUBROUTINE SKEWC                                                   GRID5390
C     WILL BE ADDED IN CAPT. CARR'S THESIS                               GRID5400
      STOP                                                               GRID5410
      END                                                                GRID5420
                                                                         GRID5430
      SUBROUTINE SKEWT                                                   GRID5440
       COMMON/CT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),RF            GRID5450
     1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                         GRID5460
       COMMON/PT/SHAPE,SQURAY,ELLIPS,ICHECK                              GRID5470
        COMMON/SHP/I1(1010),I1P(1010),I2(1010),I2P(1010)                 GRID5480
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                     GRID5490
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                                GRID5500
        COMMON/IN/AN2,BN2,XC,DIV,E,THETAF,R0                             GRID5510
        COMMON/GR/RR(1010),RF(1010),THETA0,TOTF,PSI,PSI0                 GRID5520
        COMMON/DET/A1,A2,A3,B1,B2,B3,C1,C2,C3                            GRID5530
        COMMON/DIR/RRX,RRY,RRZ,NPFX,NPFY,NPFZ,PSIR                       GRID5540
        COMMON/EN2/RRF,RFI                                               GRID5550
        COMMON/IT/ILCOP                                                  GRID5560
       COMMON/SK/K,L,IZ,IZI,M,N,NP1,FLAG(1010),IZ0,RAYS,IZ2,DRAYS        GRID5570
     1,NUMBR,COORD,NUME,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                   GRID5580
     2,COOR(500),NUMBT,COORT,GAMMA,AB,ONP,STATNA                         GRID5590
     3,RAYY(1010),RAYZ(1010),CENI,TORBI,BOTI,TOPI                        GRID5600
     4,RADIUS,CEN,TOP,BOT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP          GRID5610
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                     GRID5620
     6,NFI,NPJ,NPK,THETA,PFI,PHIP,A0,B0,C0,D0,E0,PAR1,PAR2               GRID5630
     7,PAR3,XC,YO,ZC,NUM,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI     GRID5640
     8,NUM5,CKPP,CLPP,CMPP,D3,GPL(1010),DI,NUM6,NUM7,MINCTY(1010)        GRID5650
     9,YIM(1010),ZIM(1010),ELL,ELY(7,10,10),ELZ(7,1000),ELZZ,ZOYO        GRID5660
       COMMON/SM/NUMB,THETAI,XOIAPT(1010),YOIAPT(1010),SUM1              GRID5670
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)            GRID5680
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1010),YCENTR(20,500)         GRID5690
C                                                                        GRID5700
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                            GRID5710
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT               GRID5720
      REAL N1,N2,N3                                                      GRID5730
      REAL I1,I1P,I2,I2P                                                 GRID5740
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                     GRID5750
      REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8       GRID5760
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     1,NTNCTY
      REAL NPF,NPFX,NPFY,NPFZ,NPFM,NPFMX,NPFMY,NPFMZ
C
         AS=TAN(ALPHA)
         CS=RAYY(IZ)/COS(ALFAP)
         DS=TAN(ALFAP)
         A2D2=AS**2-DS**2
         CDS=CS*DS+(AB)*A2D2
         C7D=CS**2+RAYZ(IZ)**2-((AB)**2)*A2D2-2.0*CS*DS*(AB)
      XC=1.0/A2D2*(-CDS+SQRT(CDS**2+A2D2*(C7D)))
      YC=CS-(XC+AB)*DS
      ZC=RAYZ(IZ)
         NX=-SIN(ALPHA)
         IF(YC .EQ. 0.0) GO TO 41
         ZOYC=(ZC/YC)
         IF(ZOYC .GE. 8235000) GO TO 41
         IF(ZOYC .LE. -8235000) GO TO 42
         SIG=ATAN(ZOYC)
C     DIRECTION COSINES OF OUTSIDE SURFACE NORMAL
         NY=COS(SIG)*COS(ALPHA)
         NZ=SIN(SIG)*COS(ALPHA)
         GO TO 43
   41       NY=0.0
            NZ=1.0*COS(ALPHA)
            GO TO 43
   42       NY=0.0
            NZ=-1.0*COS(ALPHA)
   43    CONTINUE
            IF(RAYY(IZ).GE.0.0)GO TO 45
            NY=-NY
            NZ=-NZ
   45  CONTINUE
C     DIRECTION COSINES OF RAY
         RX=COS(ALFAP)
         RY=-SIN(ALFAP)
         RZ=0.0
C     FRONT RADIUS
         RF1=SQRT((XC-X0)**2+YC**2+ZC**2)
         CALL INDEX(RF1,RF1,N2)
C     ANGLES OF INCIDENCE AND REFRACTION OUTSIDE SURFACE
         THETA=ARCOS(NX*RX+NY*RY)
         PHI=PI-THETA
         PHIP=ARSIN((N1/N2)*SIN(PHI))
C
C     DIRECTION COSINES OF INTERNAL REFRACTED RAY
         NUM=COS(PHIP)-N1/N2*COS(PHI)
         CKPF=N1/N2*RX-NUM*NX
         CLPF=N1/N2*RY-NUM*NY
         CMPF=-NUM*NZ
         CKP=CKPF
         CLP=CLPF
         CMP=CMPF
C     FRONT RADIUS DIRECTION OF COSINES
         RFX=(XC-X0)/RF1
         RFY=YC/RF1
         RFZ=ZC/RF1
         TOTE=ARCOS(RFX)
C     ANGLE PSI AND CONSTANT E AT FRONT SURFACE
         PSIF=ARCOS(RFX*CKP+RFY*CLP+RFZ*CMP)
         E=N2*RF1*SIN(PSIF)
C     ASSUME THETAE AND COMPUTE REAR RADIUS FROM FORMULA
         THETAE=TOTE
C     START ITTERATION TO FIND THETAE
         ILOOP=1
         EPS=1.0E-05
  401    CALL FADN2(RRF,RF1,-1.0)
         IF(RRF.GT.0.0)GO TO 402
         THETAC=TOTE
         THETAE=0.0
         GO TO 405
  402    THETA0=TOTE-THETAE
         RRX=COS(THETA0)
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      RADIUS=RRF*SIN(THETA0)                                            GRI06490
C     ITERATION TO FIND CORRECT PLACE                                   GRI06500
      CALL RAD1                                                         GRI06510
      IF(IC+ECK.NE.40)RETURN                                            GRI06520
   40 NP1=N+1                                                           GRI06530
C     INTERNAL RAY LENGTH AND INSIDE SURFACE INTERCEPT                  GRI06540
      AR=(Y2(N)-Y2(NP1))/(X2(N)-X2(NP1))                                GRI06550
      BR=(Y2(N)*X2(NP1)-Y2(NP1)*X2(N))/(X2(N)-X2(NP1))                  GRI06560
C     COMPUTE X-COORDINATE OF REAR SURFACE(XI)                          GRI06570
      XI=RRF*COS(THETA0)+XC                                             GRI06580
  403 AP=RRF**2*(1.0+AR**2)                                             GRI06590
      BP=RRF*(BR-XC*AR)                                                 GRI06600
      CP=(BR-XC*AR)**2-(AR*RRF)**2                                      GRI06610
      DEC=BP**2-AP*CP                                                   GRI06620
      IF(DEC.LT.0.0)DEC=0.0                                             GRI06630
      XNEW=-BP/AP+SQRT(DEC)/AP                                          GRI06640
      IF(XNEW.LT.0.0)XNEW=ABS(XNEW)                                     GRI06650
      IF(XNEW.GT.1.0)XNEW=1.0                                           GRI06660
      THETA1=THETA0                                                     GRI06670
      THETAC=ARSIN(XNEW)                                                GRI06680
      THETAC=(THETA0+THETA1)/2.0                                        GRI06690
      THETAE=TOTE-THETA0                                                GRI06700
      IF(THETAE.LT.0.0)THETAE=TOTE                                      GRI06710
      DIFF=ABS(THETA0-THETA1)                                           GRI06720
  404 IF(DIFF.LE.EPS)GO TO 410                                          GRI06730
  405 IF(ILOOP.GT.100)GO TO 490                                         GRI06740
      ILOOP=ILOOP+1                                                     GRI06750
      GO TO 401                                                         GRI06760
C     END OF LOOP ROUTINE TO FIND THETAE                                GRI06770
  410   IF(XI .LT. (-1.0E-03))GO TO 51                                  GRI06780
        IF(XI.LT.0.0)XI=0.0                                             GRI06790
        IF((XI-X2(1)).GT.(1.0E-03))GO TO 51                             GRI06800
        IF((XI-X2(1)).GT.0.0)XI=X2(1)                                   GRI06810
        IF(DEC.GT.0.0)GO TO 411                                         GRI06820
        DEC=BP**2-AP*CP                                                 GRI06830
        IF(DEC.GE.(1.0E-03))GO TO 411                                   GRI06840
        GO TO 51                                                        GRI06850
  411   AP=(RRF*COS(THETAF)-(XI-XC)*RFX)                                GRI06860
        IF((ABS(RFZ)).GT.(1.0E-05))GO TO 412                            GRI06870
        YI=AP/RFY                                                       GRI06880
        GO TO 415                                                       GRI06890
  412   AP=AP/RFZ                                                       GRI06900
        BP=RFY/RFZ                                                      GRI06910
        APP=1.0+BP**2                                                   GRI06920
        BPP=AP*BP                                                       GRI06930
        CPP=AP**2-(RRF*SIN(THETA0))**2                                  GRI06940
        DEC=BPP**2-APP*CPP                                              GRI06950
        IF(DEC.LT.(-5.0E-04))GO TO 50                                   GRI06960
        IF(DEC.LT.0.0)DEC=0.0                                           GRI06970
        YI=BPP/APP+SQRT(DEC)/APP                                        GRI06980
  415   DEC=((RRF*SIN(THETA0))**2-YI**2)                                GRI06990
        IF(DEC.LT.(-5.0E-04))GO TO 492                                  GRI07000
        IF(DEC.LT.0.0)DEC=0.0                                           GRI07010
        ZI=SQRT(DEC)                                                    GRI07020
C     DIRECTION COSINES OF INSIDE NORMAL                                GRI07030
      ARFUN=SQRT(1.0+AR**2)                                             GRI07040
      YZFUN=SQRT(YI**2+ZI**2)                                           GRI07050
      NXI=-AR/ARFUN                                                     GRI07060
      NYI=+YI/(YZFUN*ARFUN)                                             GRI07070
      NZI=+ZI/(YZFUN*ARFUN)                                             GRI07080
C     NORMAL TO PLANE OF THE CURVED RAY, AT XO,YO,ZO                    GRI07090
  420 NPFX=RFY*CMP-RFZ*CLP                                              GRI07100
      NPFY=RFZ*CKF-RFX*CMP                                              GRI07110
      NPFZ=RFX*CLP-RFY*CKP                                              GRI07120
      NPF=SQRT(NPFX**2+NPFY**2+NPFZ**2)                                 GRI07130
      NPFX=NPFX/NPF                                                     GRI07140
      NPFY=NPFY/NPF                                                     GRI07150
      NPFZ=NPFZ/NPF                                                     GRI07160
C     DIRECTION COSINES OF REAR RADIUS AT XI,YI,ZI                      GRI07170
      RRX=(XI-XC)/RRF                                                   GRI07180
      RRY=YI/RRF                                                        GRI07190
      RRZ=ZI/RRF                                                        GRI07200
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      IF(SQURAY.NE.2)GO TO 89                                          GRIN7310
      WRITE(6,87)IZ,XC,YC,ZC,NX,NY,NZ,RX,RY,RZ,PHI,PHIP,NUM           GRIN7320
     1,CKP,CLP,CMP,RFX,RFY,RFZ,NPFX,NPFY,NPFZ,PSIF,E                  GRIN7330
     2,XC,THETAO,THETAE,DIFF,RADIUS,DIFF,ICOMP                        GRIN7340
     3,AR,PF,XI,YI,ZI,PFX,PFY,PFZ,RRF                                GRIN7350
  85 CONTINUE                                                         GRIN7360
         CALL INDEX(PFI,RFI,NC)                                       GRIN7370
         PSIR=ARSIN(E/(N2*RFI))                                       GRIN7380
C     DIRECTION COSINES OF RAY AT XI,YI,ZI                           GRIN7390
         CALL DIRECT(CKF,CLP,CMP)                                     GRIN7400
      CCTF=NXI*CKP+NYI*CLP+NZI*CMP                                    GRIN7410
      IF(CCTF.GT.1.0)CCTF=1.0                                         GRIN7420
      IF(CCTF.LT.(-1.0))CCTF=-1.0                                     GRIN7430
      IF(SQURAY.NE.2)GO TO 99                                         GRIN7440
      WRITE(6,97)YI,ZI,ARFUN,YZFUN,NXI,NYI,NZI,CCTF,PSIR,CKP,CLP,CMP  GRIN7450
  99 CONTINUE                                                         GRIN7460
C     CALCULATE APPROXIMATE OPTICAL PATH LENGTH INSIDE LENS          GRIN7470
      D2=(RFI+RPFI)/2.0*THETAE                                        GRIN7480
C      ANGLES OF INCIDENCE OF INSIDE SURFACE                          GRIN7490
         THETAI=ARCOS(CCTF)                                           GRIN7500
         PHII=PI-THETAI                                               GRIN7510
C      CHECK FOR TOTAL INTERNAL REFLECTION:                           GRIN7520
         TIRA=ARSIN(N3/N2)                                            GRIN7530
         IF(PHII.GE.TIRA) GO TO 52                                    GRIN7540
         PHIIP=ARSIN(N2/N3*SIN(PHII))                                 GRIN7550
      RETURN                                                          GRIN7560
  50     ICHECK=50                                                    GRIN7570
         IF(SQURAY.GE.2)WRITE(6,59)IZ,RADIUS,DIFF,THETAE,THETAO,XI    GRIN7580
     1                  ,XC,RRF,RFX,RFY,RFZ,AP,BP,APP,BPP,CPP,DFC,XO,YO,ZC GRIN7590
  59     FORMAT(1X,I4,1(F8.3/4X,5F8.3,F11.3,3F8.3/)                   GRIN7600
         RETURN                                                       GRIN7610
  51     ICHECK=51                                                    GRIN7620
         IF(SQURAY.GE.2)WRITE(6,59)IZ,RADIUS,DIFF,THETAE,THETAO,XI    GRIN7630
     1                  ,XC,RRF,RFX,RFY,RFZ,AP,BP,APP,BPP,CPP,DFC,XO,YO,ZC GRIN7640
         RETURN                                                       GRIN7650
  52     ICHECK=52                                                    GRIN7660
  87 FORMAT(1X,I4,12F8.3/4X,12F8.3/4X,5F9.3,E10.2,I4/4X,9F8.3/)       GRIN7670
  97 FORMAT(4X,8F8.3/4X,4F8.3/)                                       GRIN7680
         RETURN                                                       GRIN7690
 490 IF(SQURAY.GE.2)WRITE(6,497)RADIUS,THETAO,THETAE,DIFF,IZ          GRIN7700
 497 FORMAT(2X,'DO NOT FIND SOLUTION IN SKEW'/2X,4E12.4,2X,I4)        GRIN7710
      GO TO 50                                                        GRIN7720
 492 IF(SQURAY.GE.2)WRITE(6,498)IZ,YI                                 GRIN7730
 498 FORMAT(2X,'NEGETIVE DEC. IN ZI',2X,I4,2X,F10.3)                  GRIN7740
      GO TO 50                                                        GRIN7750
      END                                                             GRIN7760
                                                                      GRIN7770
       SUBROUTINE INTERS                                              GRIN7780
       COMMON/CT/E,ALPHA,U,I,P,T(1010),N1,N2,N3,BETA(1010),RF         GRIN7790
     1,ALFAP,CFID,ELLNUM,ENUM,ELLRF,PI,RAD,ICASE                      GRIN7800
       COMMON/FT/SHAPE,SQURAY,ELLIPS,ICHECK                           GRIN7810
       COMMON/SHP/III(1010),IIP(1010),I2(1010),I2P(1010)              GRIN7820
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                  GRIN7830
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                             GRIN7840
       COMMON/FN2/RRF,RFI                                             GRIN7850
       COMMON/SK/K,L,IZ,IZI,M,N,NP1,FLAG(1010),IZO,RAYS,IZZ,DRAYS     GRIN7860
     1,NUMR,CCCPO,NUMR,IANGLE,THICK,IZA,IZB,CCUNT,IZG                 GRIN7870
     2,CCCP(500),NUMBT,COORT,GAMMA,AP,DMP,STATNA                      GRIN7880
     3,RAYY(1010),RAYZ(1010),CENI,TURBI,DOTI,TUPI                     GRIN7890
     4,RADIUS,CEN,TCP,RCT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP       GRIN7900
     5,RX,RY,N2,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                  GRIN7910
     6,RFI,NPJ,NPK,THETA,PHI,PHIP,AO,BO,CO,DO,PAR1,PAR2               GRIN7920
     7,PAR3,XC,YO,ZC,NUR,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI  GRIN7930
     8,NUME,CKFP,CLPF,CMPP,D3,UPL(1010),DI,NUM6,NUM7,NINCTY(1010)     GRIN7940
     9,YIM(1010),ZIM(1010),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO      GRIN7950
       COMMON/SM/NUM8,THETAI,XDIAPT(1010),YDIAPT(1010),SUM1           GRIN7960
     1,SUM2,SUP3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)         GRIN7970
     2,RCC(300),SUM4(300),FRACTN(300),SURAD(1010),YCENTR(20,500)      GRIN7980
C                                                                     GRIN7990
       INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                        GRIN8000
       INTEGER FLAG,RAYS,DRAYS,COORD,THICK,CCUNT,COOR,COORT           GRIN8010
       REAL N1,N2,N3                                                  GRIN8020
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      REAL I1,I1P,I2,I2P                                                GRI07930
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                   GRI07940
      REAL NPI,NFJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8     GRI07950
     1,NTACTY                                                          GRI07960
C                                                                       GRI07970
          IF(ICHECK.EQ.50)GO TO 50                                      GRI07980
          IF(ICHECK.EQ.51)GO TO 51                                      GRI07990
          IF(ICHECK.EQ.52)GO TO 52                                      GRI08000
C INSERT CALCULATION OF TRANSMITTED INTENSITY                           GRI08010
C                                                                       GRI08020
          NUM8=COS(PHIIP)-(N2/N3)*COS(PHII)                             GRI08030
C         DIRECTION COSINES OF INSIDE EXTERNAL REFRACTED RAY            GRI08040
          CKPP=(N2/N3)*CKP-NUM8*NXI                                     GRI08050
          CLPP=(N2/N3)*CLP-NUM8*NYI                                     GRI08060
          CMPP=(N2/N3)*CMP-NUM8*NZI                                     GRI08070
C         LENGTH OF INSIDE EXTERNAL REFRACTED RAY                       GRI08080
          D3=(BF-XI)/CKPP                                               GRI08090
          NUM6=((XC+AB)*RX+YO*RY)                                       GRI08100
          NUM7=((XC+AB)*(-RY)+YO*RX)                                    GRI08110
C         LENGTH OF OUTSIDE INCIDENT RAY                                GRI08120
          D1=SQRT((XC-NUM6)**2+(YO-NUM7)**2)                            GRI08130
C         TOTAL OPTICAL PATHLENGTH:                                     GRI08140
          RAVE=(RF1+RRF)/2.0                                            GRI08150
          CALL INDEX(RAVE,RF1,N2)                                       GRI08160
          OPL(IZ)=N1*D1+N2*D2*N3*D3                                     GRI08170
C         INTERSECTION WITH THE IMAGE PLANE:                            GRI08180
          YIM(IZ)=((BF-XI)/CKPP)*CLPP+YI                                GRI08190
          ZIM(IZ)=((BF-XI)/CKPP)*CMPP+ZI                                GRI08200
      IF(SQURAY.NE.2)GO TO 99                                           GRI08210
      WRITE(6,97)IZ,CKP,CLP,CMP,NXI,NYI,NZI,NUM8,CKPP,CLPP,CMPP        GRI08220
     1             ,XI,YI,ZI,XC,YO,RX,RY,BF,NUM6,NUM7                 GRI08230
     2             ,D1,D2,D3,YIM(IZ),ZIM(IZ),PHII,PHIIP               GRI08240
   99 CONTINUE                                                          GRI08250
          IF(CMPP .LT. 0.000000000001 .AND. CMPP .GT. -0.000000000001)GRI08260
     1      GO TO 46                                                   GRI08270
          XDIAPT(IZ)=(-ZIM(IZ)/CMPP)*CKPP+AB                            GRI08280
          YDIAPT(IZ)=(-ZIM(IZ)/CMPP)*CLPP+YIM(IZ)                       GRI08290
          GO TO 47                                                      GRI08300
   46 CONTINUE                                                          GRI08310
          XDIAPT(IZ)=99999.                                             GRI08320
          YDIAPT(IZ)=99999.                                             GRI08330
   47 CONTINUE                                                          GRI08340
          IF(SQURAY .EQ. 1) WRITE(6,500)IZ,RAYY(IZ),RAYZ(IZ),XO,YO,    GRI08350
     1    XI,YI,ZI,OPL(IZ),YIM(IZ),ZIM(IZ),NTACTY(IZ),XDIAPT(IZ),     GRI08360
     2    YDIAPT(IZ)                                                    GRI08370
     3   ,PHII,PHIIP,CKPP,CLPP,CMPP,D3,D1,NUM6,NUM7,NUM8               GRI08380
  471      FLAG(IZ)=0                                                   GRI08390
   49 CONTINUE                                                          GRI08400
      IZ1=IZ                                                            GRI08410
      IZ=IZ1+1                                                          GRI08420
      NTACTY(IZ)=1.0                                                    GRI08430
      RAYY(IZ)=RAYY(IZ1)                                                GRI08440
      RAYZ(IZ)=RAYZ(IZ1)+GRID                                           GRI08450
      IF(FLAG(IZ1) .EQ. 0) COUNT=COUNT+1                                GRI08460
      ICHECK=30                                                         GRI08470
      RETURN                                                            GRI08480
C     END OF RAY TRACE                                                  GRI08490
   50 ICHECK=0                                                          GRI08500
      NTACTY(IZ)=0.0                                                    GRI08510
      FLAG(IZ)=1                                                        GRI08520
      IF(SQURAY .EQ. 1) WRITE(6,600)IZ,RAYY(IZ),RAYZ(IZ),PHI,PHIP      GRI08530
      GO TO 49                                                          GRI08540
   51 ICHECK=1                                                          GRI08550
      NTACTY(IZ)=0.0                                                    GRI08560
      FLAG(IZ)=2                                                        GRI08570
      IF(SQURAY .EQ. 1) WRITE(6,700)IZ,RAYY(IZ),RAYZ(IZ),XI             GRI08580
      GO TO 49                                                          GRI08590
   52 ICHECK=2                                                          GRI08600
      NTACTY(IZ)=0.0                                                    GRI08610
      FLAG(IZ)=3                                                        GRI08620
      IF(SQURAY .EQ. 1) WRITE(6,800)IZ,RAYY(IZ),RAYZ(IZ),PHII,TIRA      GRI08630
      GO TO 49                                                          GRI08640
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 97 FORMAT(1X,14,1PE9.5/3X,1PE9.5/3X,7E9.5/)                                    GRI08650
 98 FORMAT(1X,14,11PE9.5,1X,2E10.3/4X,10E9.4/)                                  GRI08660
600 FORMAT(1X,14,2F10.7,' NO INTERCEPT WITH 2ND SURFACE; PHI= ',F10.7,GRI08670
    1,' PHIP= ',F10.7/)                                                         GRI08680
700 FORMAT(1X,14,2F10.7,' INTERCEPT OUTSIDE BOUNDARY OF 2ND SURFACE; YGRI08690
    1= ',F10.7/)                                                                GRI08700
800 FORMAT(1X,14,2F10.7,2X,'TOTAL INTERNAL REFLECTION AT 2ND SURFACE; GRI08710
    1PHI= ',F10.7,' ,PHIP= ',F10.7/)                                            GRI08720
    END                                                                         GRI08730
                                                                                GRI08740
    SUBROUTINE IMAGE                                                            GRI08750
     COMMON/CT/F,ALPHA,U,I,S,T(1010),N1,N2,N3,BETA(1010),BF                     GRI08760
    1,ALFAP,GFIC,ELLNUM,ENUM,ELLOF,PI,RAD,ICASE                                 GRI08770
     COMMON/P1/SHAPE,SQUAY,ELLIPS,ICHECK                                        GRI08780
     COMMON/SHP/I(1010),IIP(1010),I2(1010),I2P(1010)                            GRI08790
    1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                             GRI08800
    2,J,UP(1010),DYDX1(1010),DYDX2(1010)                                        GRI08810
     COMMON/SWK/K,L,IZ,IZ1,M,N,NP1,FLAG(1010),IZO,RAYS,IZ2,DRAYS                GRI08820
    1,ALMBR,CCCPD,NUMP,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                           GRI08830
    2,CCOR(5PE),NUMRT,COORT,GAMMA,AP,ONP,STETNA                                 GRI08840
    3,RAYY(1010),RAYZ(1010),CENI,TOPBI,BOTI,TOPI                                GRI08850
    4,RADIUS,CEN,TEF,BCT,TORR,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP                  GRI08860
    5,AX,AY,AZ,PX,PY,PZ,RXI,RYI,RZI,PHII,PHIIP,TIRA                             GRI08870
    6,AFI,NPJ,NPK,THETA,PHI,PHIP,AO,BO,CO,DO,EO,PAP1,PAP2                       GRI08880
    7,PAP3,XC,YC,ZO,NLP,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,C2,XI,YI,ZI             GRI08890
    8,NUM5,CKPP,CLPP,CMPP,D3,OPL(1010),DI,NUM6,NUM7,NTNCTY(1010)                GRI08900
    9,YIP(1010),ZIP(1010),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO                 GRI08910
     COMMON/SM/NUME,THETAI,XDIAPT(1010),YDIAPT(1010),SUM1                       GRI08920
    1,SUM2,SUP3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)                    GRI08930
    2,RCC(30C),SUM4(30C),FRACT(30C),SORAD(1010),YCENTR(20,500)                  GRI08940
C                                                                               GRI08950
    INTEGER ELLNUM,EAUM,SHAPE,SQUAY,ELLIPS                                      GRI08960
    INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT                        GRI08970
    REAL N1,N2,N3                                                               GRI08980
    REAL I1,IIP,I2,I2P                                                          GRI08990
    1,NP,NY,NZ,RX,RY,RZ,RXI,NYI,NZI,PHII,PHIIP,TIRA                             GRI09000
    REAL NP1,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8                GRI09010
    1,NTNCTY                                                                    GRI09020
C                                                                               GRI09030
C     MIRROR IMAGE RAY MATCHING FOLLOWS                                         GRI09040
C                                                                               GRI09050
 60 CONTINUE                                                                    GRI09060
    IF(SQUAY .EQ. 1) WRITE(6,401)                                               GRI09070
    I2C=IZ-1                                                                    GRI09080
    I22=IZ-IZO                                                                  GRI09090
 61 CONTINUE                                                                    GRI09100
    IF(RAYZ(I22) .EQ. 0.0) I22=I22+1                                            GRI09110
      IF(I22 .GT. IZ2) GO TO 70                                                 GRI09120
        FLAG(IZ)=FLAG(I22)                                                      GRI09130
        IF(FLAG(IZ) .EQ. 0) COUNT=COUNT+1                                       GRI09140
        RAYY(IZ)=RAYY(I22)                                                      GRI09150
        RAYZ(IZ)=-RAYZ(I22)                                                     GRI09160
        IF(FLAG(I22) .GE. 1) GO TO 63                                           GRI09170
          XDIAPT(IZ)=XDIAPT(I22)                                                GRI09180
          YDIAPT(IZ)=YDIAPT(I22)                                                GRI09190
          YIP(IZ)=YIP(I22)                                                      GRI09200
          ZIP(IZ)=-ZIP(I22)                                                     GRI09210
          OPL(IZ)=OPL(I22)                                                      GRI09220
          NTNCTY(IZ)=NTNCTY(I22)                                                GRI09230
          IF(SQUAY .EQ. 1) WRITE(6,501) IZ,I22,RAYY(IZ),RAYZ(IZ),               GRI09240
     1    OPL(IZ),YIP(IZ),ZIP(IZ),NTNCTY(IZ),XDIAPT(IZ),YDIAPT(IZ)            GRI09250
 62 CONTINUE                                                                    GRI09260
    IZ2=IZ2+1                                                                   GRI09270
    IZ=IZ+1                                                                     GRI09280
    GO TO 61                                                                    GRI09290
 63 CONTINUE                                                                    GRI09300
    IF(FLAG(I22) .GE. 2) GO TO 64                                               GRI09310
      IF(SQUAY .EQ. 1) WRITE(6,601)IZ,I22,RAYY(IZ),RAYZ(IZ)                     GRI09320
      GO TO 62                                                                  GRI09330
 64 CONTINUE                                                                    GRI09340
    IF(FLAG(I22) .EQ. 3) GO TO 65                                               GRI09350
      IF(SQUAY .EQ. 1) WRITE(6,701)IZ,I22,RAYY(IZ),RAYZ(IZ)                     GRI09360
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      GO TO 62                                                          GRI09370
   65 CONTINUE                                                          GRI09380
      IF(SQURAY .EQ. 1) WRITE(6,801)IZ,IZ2,RAYY(IZ),RAYZ(IZ)            GRI09390
      GO TO 62                                                          GRI09400
   70 CONTINUE                                                          GRI09410
      RAYS=IZ-1                                                         GRI09420
      DRAYS=RAYS-IZ0                                                    GRI09430
      IF(SQURAY .EQ. 1) WRITE(6,900)RAYS,DRAYS,COUNT                    GRI09440
C                                                                       GRI09450
C     GENERATE OBJECT PLANE ELLIPSES:                                   GRI09460
C                                                                       GRI09470
      IF(ELLIPS .EQ. 1) WRITE(6,1000)ENUM                               GRI09480
      NUMBR=1                                                           GRI09490
      NUMB=1                                                            GRI09500
   71 CONTINUE                                                          GRI09510
      CCORD=1                                                           GRI09520
      ELZ(NUMB,CCORD)=-Y1(NUMBR)                                        GRI09530
   72 CONTINUE                                                          GRI09540
      ELY(NUMB,CCORD)=(X1(NUMBR)+AB)*SIN(ALFAP)+SQRT((Y1(NUMBR))**2-    GRI09550
     1(ELZ(NUMB,CCORD))**2)*COS(ALFAP)                                  GRI09560
      ELZZ=ELZ(NUMB,CCORD)                                              GRI09570
      IF(ELLIPS .EQ. 1) WRITE(6,1100)NUMBR,CCORD,ELY(NUMB,CCORD),       GRI09580
     1ELZ(NUMB,CCORD)                                                   GRI09590
      CCORD=CCORD+1                                                     GRI09600
      ELZ(NUMB,CCORD)=ELZZ+ELL                                          GRI09610
      IF(ELZ(NUMB,CCORD) .GE. Y1(NUMBR)) GO TO 73                       GRI09620
      GO TO 72                                                          GRI09630
   73 CONTINUE                                                          GRI09640
      ELZZ=ELZ(NUMB,CCORD)                                              GRI09650
   74 CONTINUE                                                          GRI09660
      ELZ(NUMB,CCORD)=ELZZ-ELL                                          GRI09670
      IF(ELZ(NUMB,CCORD) .LE. -Y1(NUMBR)) GO TO 75                      GRI09680
      ELY(NUMB,CCORD)=(X1(NUMBR)+AB)*SIN(ALFAP)-SQRT((Y1(NUMBR))**2-    GRI09690
     1(ELZ(NUMB,CCORD))**2)*COS(ALFAP)                                  GRI09700
      ELZZ=ELZ(NUMB,CCORD)                                              GRI09710
      IF(ELLIPS .EQ. 1) WRITE(6,1100)NUMBR,COORD,ELY(NUMB,CCORD),       GRI09720
     1ELZ(NUMB,CCORD)                                                   GRI09730
      CCOR(NUMB)=CCORD                                                  GRI09740
      CCORD=CCORD+1                                                     GRI09750
      GO TO 74                                                          GRI09760
   75 CONTINUE                                                          GRI09770
      NUMBR=NUMBR+(K-1)/ELLNUM                                          GRI09780
      NUMB=NUMB+1                                                       GRI09790
      IF(NUMBR .GT. K) GO TO 76                                         GRI09800
      GO TO 71                                                          GRI09810
   76 CONTINUE                                                          GRI09820
      IF(ELLIPS .EQ. 1) WRITE(6,1200)                                   GRI09830
      NUMB=NUMB-1                                                       GRI09840
C                                                                       GRI09850
C     IMAGE PLANE SPOT DIAGRAM STATISTICAL ANALYSIS:                    GRI09860
C                                                                       GRI09870
      SUM1=0.0                                                          GRI09880
      DO 77 IZ=1,RAYS                                                   GRI09890
        IF(FLAG(IZ) .GT. 0) GO TO 77                                    GRI09900
        SUM1=YIM(IZ)+SUM1                                               GRI09910
   77 CONTINUE                                                          GRI09920
C     REFERENCE EACH ITERATION TO INCIDENT ANGLE & THICKNESS BY:        GRI09930
      IANGLE=ALFAP*IC                                                   GRI09940
      ITHICK=(T(1))*ICO                                                 GRI09950
C     CENTROID OF SPOT:                                                 GRI09960
      YCENTR(IANGLE,ITHICK)=SUM1/COUNT                                  GRI09970
C     STANDARD DEVIATIONS:                                              GRI09980
      SUM2=0.0                                                          GRI09990
      SUM3=0.0                                                          GRI10000
      DO 78 IZ=1,RAYS                                                   GRI10010
        IF(FLAG(IZ) .GT. 0) GO TO 78                                    GRI10020
        SUM2=YIM(IZ)**2+SUM2                                            GRI10030
        SUM3=(YCENTR(IANGLE,ITHICK)-YIM(IZ))**2+SUM3                    GRI10040
   78 CONTINUE                                                          GRI10050
      SIGRAZ(IANGLE,ITHICK)=SUM2/COUNT                                  GRI10060
      SIGMAY(IANGLE,ITHICK)=SUM3/COUNT                                  GRI10070
C     RMS MEAN SQUARE SPOT SIZE:                                        GRI10080
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      RMSRAD(IANGLE,THICK)=SQRT(SIGMAZ(IANGLE,THICK)+SIGMAY(IANGLE,      GRI10090
     1THICK))                                                            GRI10100
  401 FORMAT('1','MIRROR IMAGE SKEW RAYS FOLLOW'///1X,'IMAGE'/2X,'RAY  ',GRI10110
     1AY    RAYN        RAYZ          OPL          YIM          ZIM      GRI10120
     1       DCIAPT'/81X,'YDIAPT'//)                                     GRI10130
  501 FORMAT(I4,1X,I4,2F10.7,F13.9,3F11.7,F15.3/72X,F15.3/)              GRI10140
  601 FORMAT(I4,1X,I4,2F10.7,' NO INTERCEPT WITH 2ND SURFACE'/)          GRI10150
  701 FORMAT(I4,1X,I4,2F10.7,' INTERCEPT OUTSIDE OF BOUNDARY OF 2ND SURFGRI10160
     1ACE'/)                                                             GRI10170
  801 FORMAT(I4,1X,I4,2F10.7,' TOTAL INTERNAL REFLECTION'/)              GRI10180
  900 FORMAT(1X,'END OF SKEW RAY TRACE.'//3X,'TOTAL NUMBER OF RAYS TRACEGRI10190
     1D = ',I4/3X,'TOTAL NUMBER OF MIRROR IMAGE RAYS = ',I4/3X,'TOTAL NUGRI10200
     1MBER OF RAYS STRIKING IMAGE PLANE = ',I4)                          GRI10210
 1000 FORMAT('1','TWO DIMENSIONAL PROJECTION OF 3-DIM LENS'///3X,'GENERAGRI10220
     1TED ELLIPSES ARE REFERENCED TO THE CORRESPONDING JTH COORDINATE   IGRI10230
     1N THE MERIDIAN PLANES AS COMPUTED IN THE ABOVE'/3X,'GLM LENS SHAPEGRI10240
     1 ALGORITHM. INSIDE AND OUTSIDE ELLIPSES CORRESPOND TO THE OPAQUE AGRI10250
     1CLARITIES.'/3X,'THE NUMBER OF ELLIPSES GENERATED = ',I3//1X,'   J GRI10260
     1 COORD       ELY          ELZ'//)                                 GRI10270
 1100 FORMAT(1X,I4,4X,I4,2F10.7)                                        GRI10280
 1200 FORMAT(1X,'CALCULATION OF ELLIPSE COORDINATES COMPLETE.')          GRI10290
      RETURN                                                            GRI10300
      END                                                               GRI10310
                                                                        GRI10320
      SUBROUTINE SUMP                                                   GRI10330
      COMMON/CT/F,ALPHA,U,I,R,T(10,10),N1,N2,N3,BETA(10,10),PF          GRI10340
     1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                        GRI10350
      COMMON/PT/SHAPE,SQURAY,ELLIPS,ICHECK                              GRI10360
      COMMON/SHP/II(10,10),IIP(10,10),I2(10,10),I2P(10,10)              GRI10370
     1,ETA(10,10),X1(10,10),Y1(10,10),X2(10,10),Y2(10,10)               GRI10380
     2,J,UP(10,10),DYDXI(10,10),DYDXN(10,10)                            GRI10390
      COMMON/SK/K,L,IZ,IZ1,M,N,NP1,FLAG(10,10),IZ),RAYS,IZ2,DRAYS       GRI10400
     1,NUMBR,COORD,NUMP,ANGLE,THICK,IZ4,IZ5,COUNT,IZ6                   GRI10410
     2,COOR(500),NUMPT,COORT,GAMMA,AP,ONP,STATNA                        GRI10420
     3,RAYY(10,10),RAYZ(10,10),CENI,TCPRI,ROTI,TOPI                     GRI10430
     4,RADIUS,CEN,TCP,ECT,TORD,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         GRI10440
     5,N3,NY,NZ,RX,RY,PZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    GRI10450
     6,API,NPJ,APK,THETA,PHI,PHIP,AO,BO,CO,DO,EO,PAR1,PAR2              GRI10460
     7,PAR3,XC,YC,ZC,RUP,CRP,CLP,CRP,NUM1,NUP2,NUM3,NUM4,D2,XI,YI,ZI    GRI10470
     8,NUM5,CKEP,CLPP,CPPP,D3,CPLI(10),DL,NUM6,NUM7,NTNCTY(10,10)       GRI10480
     9,YIM(10,10),ZIM(10,10),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO      GRI10490
      COMMON/SP/NUMP,THETAI,XDIAPT(10,10),YDIAPT(10,10),SUM1            GRI10500
     1,SUM2,SUP3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)           GRI10510
     2,ROC(300),SUM4(300),FRACTN(300),SDRAD(10,10),YCENTR(20,500)       GRI10520
C                                                                       GRI10530
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                           GRI10540
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT              GRI10550
      REAL N1,N2,N3                                                     GRI10560
      REAL II,IIP,I2,I2P                                                GRI10570
     1,NX,NY,NZ,RX,RY,PZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    GRI10580
      REAL NPI,NPJ,NPK,NUM,NUM1,NUP2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8      GRI10590
     1,NTNCTY                                                           GRI10600
C                                                                       GRI10610
C WRITE PARAMETER SUMMARY HERE                                          GRI10620
C                                                                       GRI10630
      WRITE(6,1300)T(1,1),U,ALFAP,R,YCENTR(IANGLE,THICK),               GRI10640
     1SIGMAY(IANGLE,THICK),SIGMAZ(IANGLE,THICK),RMSRAD(IANGLE,THICK)    GRI10650
C                                                                       GRI10660
C     SPOT DIAGRAM ENERGY DENSITY VS. RADIUS FROM CENTROID:             GRI10670
C                                                                       GRI10680
      DO 79 IZ=1,RAYS                                                   GRI10690
        IF(FLAG(IZ) .GT. 0) GO TO 79                                    GRI10700
        SDRAD(IZ)=SQRT((YCENTR(IANGLE,THICK)-YIM(IZ))**2+ZIM(IZ)**2)    GRI10710
   79 CONTINUE                                                          GRI10720
      IZ4=1                                                             GRI10730
      ROC(IZ4)=0.005                                                    GRI10740
      SUM4(IZ4)=0.0                                                     GRI10750
   80 CONTINUE                                                          GRI10760
      DO 81 IZ=1,RAYS                                                   GRI10770
        IF(FLAG(IZ) .GT. 0) GO TO 81                                    GRI10780
        IF(SDRAD(IZ) .LE. ROC(IZ4)) SUM4(IZ4)=1+SUM4(IZ4)               GRI10790
   81 CONTINUE                                                          GRI10800
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      FRACTN(IZ4)=SUM4(IZ4)/RAYS                                        GRI10810
      WRITE(6,1400) IZ4,ROC(IZ4),FRACTN(IZ4)                            GRI10820
      IZ5=IZ4                                                           GRI10830
      IZ4=IZ4+1                                                         GRI10840
      RCC(IZ4)=RCC(IZ5)+0.005                                           GRI10850
      SUM4(IZ4)=0.0                                                     GRI10860
      IF(ROC(IZ4) .GT. 0.5) GO TO 82                                    GRI10870
      GO TO 80                                                          GRI10880
   82 CONTINUE                                                          GRI10890
      IZ6=IZ4-1                                                         GRI10900
      WRITE(6,1500)                                                     GRI10910
 1300 FORMAT('1',1X,'IMAGE PLANE SPOT DIAGRAM ANALYSIS:'///1X,'THICKNESSGRI10920
     1 =',F9.7,' U =',F9.7,' ALFAP =',F9.7,'  R =',F9.7//1X,'CENTROID:GRI10930
     1 ZCENTR = 0.0,  YCENTR = ',F10.7//1X,'STANDARD DEVIATIONS:  SIGMAYGRI10940
     1 = ',F10.7,2X,'SIGMAZ = ',F10.7//1X,'RMS SPOT SIZE: RMSRAD = ',GRI10950
     1F10.7///1X,'SPOT DIAGRAM ENERGY DENSITY VS. RADIUS FROM CENTROID:'GRI10960
     1//1X,' IZ4    RADIUS    FRACTION'//)                             GRI10970
 1400 FORMAT(14,2F11.7)                                                 GRI10980
 1500 FORMAT(1X,'SPOT DIAGRAM CALCULATIONS COMPLETE.')                  GRI10990
      RETURN                                                            GRI11000
      END                                                               GRI11010
                                                                        GRI11020
      SUBROUTINE PLOTT                                                  GRI11030
        COMMON/CT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),HF          GRI11040
     1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                        GRI11050
        COMMON/PT/SHAPE,SQURAY,ELLIPS,ICHECK                            GRI11060
        COMMON/SHP/II(1010),IIP(1010),I2(1010),I2P(1010)                GRI11070
     1,ETA(101C),XI(1010),YI(1010),X2(1010),Y2(1010)                    GRI11080
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               GRI11090
        COMMON/IN/AN2,BN2,XC,CIV,E,THETAE,RO                            GRI11100
        COMMON/SK/K,L,IZ,IZ1,M,N,NP1,FLAG(1010),IZ0,RAYS,IZ2,DRAYS      GRI11110
     1,NUMBR,CCORD,NUMP,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                  GRI11120
     2,CCOR(5CC),NUMBT,COORT,GAMMA,AB,ONP,STATNA                        GRI11130
     3,RAYY(1010),RAYZ(1010),CENI,TORBI,BOTI,TOPI                       GRI11140
     4,RADIUS,CEN,TOP,BOT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         GRI11150
     5,AX,NY,AZ,RX,RY,RZ,AXI,NYI,NZI,PHII,PHIIP,TIRA                    GRI11160
     6,API,APJ,APK,THETA,PHI,PHIP,A0,B0,C0,D0,E0,PAR1,PAR2              GRI11170
     7,PAR3,XC,YC,ZC,AUP,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI    GRI11180
     8,NUM5,CKPP,CLPP,CMPP,D3,OPL(1010),D1,NUM6,NUM7,MTNCTY(1010)       GRI11190
     9,YIM(101C),ZIM(1010),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO        GRI11200
        COMMON/SM/NUM8,THETA1,XDIAPT(1010),YDIAPT(1010),SUM1            GRI11210
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)           GRI11220
     2,REC(300),SUM4(300),FRACTN(300),SDRAD(1010),YCENTR(20,500)        GRI11230
C                                                                       GRI11240
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                           GRI11250
      INTEGER FLAG,RAYS,DRAYS,CCORD,THICK,COUNT,COOR,COORT              GRI11260
      REAL N1,N2,N3                                                     GRI11270
      REAL I1,IIP,I2,I2P                                                GRI11280
     1,AX,NY,AZ,RX,RY,RZ,AXI,NYI,NZI,PHII,PHIIP,TIRA                    GRI11290
      REAL API,APJ,APK,AUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8      GRI11300
     1,MTNCTY                                                           GRI11310
C                                                                       GRI11320
C     PLOT OUTPUT                                                       GRI11330
C                                                                       GRI11340
C     WRITE OUTPUT FOR PLOT INTO FILE FT01F001                          GRI11350
C                                                                       GRI11360
C                                                                       GRI11370
      WRITE(1,831F,ALPHA,U,I,R,T(1),N1,N2,N3,ALFAP,GRID,STATNA,GAMMA    GRI11380
     1,RAYS,CCUNT,K,IZE,IANGLE,THICK,XC,CIV                             GRI11390
   83 FORMAT(' ',3F9.7,I4,4F9.7/' ',3F9.7,F9.5,F9.7// ' ',6I4,2F8.5)    GRI11400
      DO 85 J=1,K                                                       GRI11410
         WRITE(1,84)X1(J),Y1(J),X2(J),Y2(J)                             GRI11420
   84    FORMAT(' ',4F10.7)                                             GRI11430
   85 CONTINUE                                                          GRI11440
      DO 88 IZ=1,RAYS                                                   GRI11450
         WRITE(1,86)RAYY(IZ),RAYZ(IZ),FLAG(IZ)                          GRI11460
   86    FORMAT(' ',2F10.7,3X,I1)                                       GRI11470
         IF(FLAG(IZ) .GT. 1) GO TO 88                                   GRI11480
           WRITE(1,87)YIM(IZ),ZIM(IZ)                                   GRI11490
   87      FORMAT(' ',2F10.7)                                           GRI11500
   88 CONTINUE                                                          GRI11510
      DO 90 IZ4=1,IZE                                                   GRI11520
```

```
      WRITE(1,89)RCC(IZ4),ERACTN(IZ4)                                   GRI11530
   89 FORMAT(' ',F10.7,2X,F10.7)                                        GRI11540
   90 CONTINUE                                                          GRI11550
      WRITE(1,91)YCENTR(IANGLE,THICK),SIGMAY(IANGLE,THICK),             GRI11560
     1SIGMAZ(IANGLE,THICK),RMSRAD(IANGLE,THICK),NUMAT                   GRI11570
   91 FORMAT(' ',4E10.7,I4)                                             GRI11580
      DO 96 NUMB=1,NUMPT                                                GRI11590
      WRITE(1,92)CCOR(NUMB)                                             GRI11600
   92 FORMAT(' ',I3)                                                    GRI11610
      COORT=CCOR(NUMB)                                                  GRI11620
      DO 95 COORD=1,COORT                                               GRI11630
      WRITE(1,94)FLY(NUMB,COORD),FLZ(NUMB,COORD)                        GRI11640
   94 FORMAT(' ',F11.4,3X,F11.8)                                        GRI11650
   95 CONTINUE                                                          GRI11660
   96 CONTINUE                                                          GRI11670
      WRITE(1,97)                                                       GRI11680
   97 FORMAT(' ','/*')                                                  GRI11690
      WRITE(6,98)                                                       GRI11700
   98 FORMAT(' ','TO OBTAIN PLOTS FROM THE PLOTTER OR THE PRINTER,'/' ',GRI11710
     1'ISSUE THE FOLLOWING COMMAND: '/' ',8X,'FOR PRINTER PLOTS',       GRI11720
     1T36,'ENTER "LENSCOM PRINTER"'/' ',8X,'FOR PLOTTER GRAPHS',T36,    GRI11730
     1'ENTER "LENSCOM PLOTTER"')                                        GRI11740
      WRITE(6,99)                                                       GRI11750
   99 FORMAT(' ','END OF PROGRAM')                                      GRI11760
      RETURN                                                            GRI11770
      END                                                               GRI11780
                                                                        GRI11790
      SUBROUTINE INDEX(R,RF,N2)                                         GRI11800
      COMMON/IN/AN2,BN2,XC,DIV,E,THETAE,R0                              GRI11810
      REAL N2                                                           GRI11820
      N2=SQRT(AN2+BN2*(R/R0)**2)                                        GRI11830
      RETURN                                                            GRI11840
      END                                                               GRI11850
                                                                        GRI11860
      SUBROUTINE RADN2(R,RF,EPSI)                                       GRI11870
      COMMON/PT/SHAPE,SCURAY,ELLIPS,ICHECK                              GRI11880
      COMMON/IN/AN2,BN2,XC,DIV,E,THETAE,R0                              GRI11890
      COMMON/RA/BR1,BR2                                                 GRI11900
C     R IS THE OUTPUT RADIUS;R0 IS THE INPUT RADIUS                     GRI11910
C     AT SHAPE1, WHEN J=1 RR IS COMPUTED FROM KNOWN RF(EPSI=-1.0)       GRI11920
C                WHEN J.GT.1 RF IS COMPUTED FROM KNOWN RR(EPSI=1.0)     GRI11930
C     AT SKEW1, RR IS COMPUTED FROM KNOWN RF(EPSI=-1.0)                 GRI11940
      DEC=(AN2**2+4.0*BN2*(E/R0)**2)                                    GRI11950
      IF(DEC.GT.0.0)GO TO 10                                            GRI11960
      WRITE(6,31)AN2,BN2,E,R0,RF,DEC                                    GRI11970
      STOP                                                              GRI11980
   10 BR1=SQRT(AN2**2+4.0*BN2*(E/R0)**2)                                GRI11990
      BR2=(2.0*(E/RF)**2-AN2)/BR1                                       GRI12000
      DEL=ABS(BR2)-1.0                                                  GRI12010
      IF(DEL.LE.0.0)GO TO 15                                            GRI12020
      IF(BR2.GT.1.0)GO TO 13                                            GRI12030
      BR2=-1.0                                                          GRI12040
      GO TO 15                                                          GRI12050
   13 BR2=1.0                                                           GRI12060
   15 DEC=(AN2+BR1*SIN(EPSI*2.0*THETAE+ARSIN(BR2)))                     GRI12070
      IF(DEC.GT.0.0)GO TO 20                                            GRI12080
      IF(SCURAY.GE.2)WRITE(6,31)AN2,BN2,E,R0,RF,DEC,BR1,BR2,THETAE      GRI12090
      R=-1.0                                                            GRI12100
      RETURN                                                            GRI12110
   20 R=SQRT(2.0*E**2/(AN2+BR1*SIN(EPSI*2.0*THETAE+ARSIN(BR2))))        GRI12120
   30 FORMAT(2X,'NEGETIVE RESULTS IN RADN2'/2X,5E8.4,E10.3)             GRI12130
   31 FORMAT(2X,5E8.4,E10.3,3E8.4)                                      GRI12140
      RETURN                                                            GRI12150
      END                                                               GRI12160
                                                                        GRI12170
      SUBROUTINE ITER                                                   GRI12180
      COMMON/ET/F,ALPHA,U,I,R,I1(1010),N1,N2,N3,BETA(1010),RF           GRI12190
     1,ALFAP,GRID,ELLNUM,ENUM,ELLBI,PI,RAD,ICASE                        GRI12200
      COMMON/PT/SHAPE,SCURAY,ELLIPS,ICHECK                              GRI12210
      COMMON/SHP/I1(1010),I1P(1010),I2(1010),I2P(1010)                  GRI12220
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    GRI12230
     2,J,UP(1010),DYEXT(1010),DYDXN(1010)                               GRI12240
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      COMMON/IN/AN2,BN2,XC,DIV,E,THETAE,R0                              GRI12250
      COMMON/GN/RR(1010),RF(1010),THETA0,TOTE,PSI,PSI0                  GRI12260
      COMMON/RA/BR1,BR2                                                 GRI12270
      REAL N1,N2,N3                                                     GRI12280
      REAL I1,I1P,I2,I2P                                                GRI12290
     1,AX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    GRI12300
C                                                                       GRI12310
      ILOOP=1                                                           GRI12320
      EPS=1.E-05                                                        GRI12330
      EPSI=1.0                                                          GRI12340
      IF(J.EQ.1)EPSI=-1.0                                               GRI12350
   12 CALL RADN2(RFF,RR(J),EPSI)                                        GRI12360
      RF(J)=XC*TAN(ALPHA)/(SIN(TOTE)-TAN(ALPHA)*COS(TOTE))              GRI12370
      FX=RFF-RF(J)                                                      GRI12380
      F1P=-EPSI*0.5/E**2*(RFF**3)*FR1*COS(EPSI*2.0*THETAE+ARSIN(BR2))   GRI12390
      F2P=-XC*TAN(ALPHA)*(COS(TOTE)+TAN(ALPHA)*SIN(TOTE))               GRI12400
     1/((SIN(TOTE)-TAN(ALPHA)*COS(TOTE))**2)                            GRI12410
      FXDOT=F1P-F2P                                                     GRI12420
      XNEW=THETAE-FX/FXDOT/1.3                                          GRI12430
   13 DIFF=ABS(THETAE-XNEW)                                             GRI12440
      IF(DIFF.GT.EPS)GO TO 15                                           GRI12450
      RETURN                                                            GRI12460
   15 IF(ILOOP.GT.90)RETURN                                             GRI12470
      ILOOP=ILOOP+1                                                     GRI12480
      THETAE=XNEW                                                       GRI12490
      CALL POINTS                                                       GRI12500
      CALL FRONT                                                        GRI12510
      GO TO 12                                                          GRI12520
   19 CONTINUE                                                          GRI12530
      IF(SQUARY.GE.2)WRITE(6,10)J,THETAE,DIFF                           GRI12540
   10 FORMAT(1X,'SUITABLE SOLUTION WAS NOT FOUND AFTER 90  ITER'        GRI12550
     1,3X,I4,3X,F7.4,3X,E8.2)                                           GRI12560
   20 FORMAT(1X,I4,F7.4,3X,E8.2)                                        GRI12570
      STOP                                                              GRI12580
      END                                                               GRI12590
                                                                        GRI12600
      SUBROUTINE DIRECT(CKP,CLP,CMP)                                    GRI12610
      COMMON/DIR/RRX,RRY,RRZ,NPFX,NPFY,NPFZ,PSIR                        GRI12620
      REAL NPFX,NPFY,NPFZ                                               GRI12630
      EPS=1.0E-06                                                       GRI12640
      SIGN=+1.0                                                         GRI12650
      IF((ABS(NPFX)).GT.EPS)GO TO 50                                    GRI12660
      IF((ABS(NPFY)).GT.EPS)GO TO 30                                    GRI12670
      IF((ABS(RRY)).LT.EPS)GO TO 25                                     GRI12680
         CMP=0.0                                                        GRI12690
      APP=1.0+(RRX/RRY)**2                                              GRI12700
      BPP=COS(PSIR)*RRX/RRY**2                                          GRI12710
      CPP=(COS(PSIR)/RRY)**2-1.0                                        GRI12720
         CKP=BPP/APP+SIGN*SQRT(BPP**2-APP*CPP)/APP                      GRI12730
         CLP=(COS(PSIR)-RRX*CKP)/RRY                                    GRI12740
         RETURN                                                         GRI12750
   25    CMP=0.0                                                        GRI12760
         CKP=COS(PSIR)/RRX                                              GRI12770
         CLP=SIGN*SQRT(1.0-CKP**2)                                      GRI12780
         RETURN                                                         GRI12790
   30 IF((ABS(NPFZ)).GT.EPS)GO TO 40                                    GRI12800
      IF((ABS(RRZ)).LT.EPS)GO TO 35                                     GRI12810
         CLP=0.0                                                        GRI12820
      APP=1.0+(RRX/RRZ)**2                                              GRI12830
      BPP=COS(PSIR)*RRX/RRZ**2                                          GRI12840
      CPP=(COS(PSIR)/RRZ)**2-1.0                                        GRI12850
         CKP=BPP/APP+SQRT(BPP**2-APP*CPP)/APP                           GRI12860
         CMP=(COS(PSIR)-RRX*CKP)/RRZ                                    GRI12870
         RETURN                                                         GRI12880
   35    CLP=0.0                                                        GRI12890
         CKP=COS(PSIR)/RRX                                              GRI12900
         CMP=SIGN*SQRT(1.0-CKP**2)                                      GRI12910
         RETURN                                                         GRI12920
   40 IF((ABS(RRX)).GT.EPS)GO TO 45                                     GRI12930
         CLP=COS(PSIR)/(RRY-NPFY/NPFZ*RRZ)                              GRI12940
         CMP=-NPFY/NPFZ*CLP                                             GRI12950
         CKP=SIGN*SQRT(1.0-CLP**2-CMP**2)                               GRI12960
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```
      RETURN                                                            GRI13270
   45 IF((ABS(RRY-NPFY/NPFZ*RRZ)).GT.EPS)GO TO 47                       GRI13280
      CKP=CCS(PSIR)/RRX                                                 GRI13290
      CLP=SIGN*SQRT(1.0-CKP**2)/(1.0+(NPFY/NPFZ)**2)                    GRI13300
      CMP=-NPFY/NPFZ*CLP                                                GRI13310
      RETURN                                                            GRI13320
   47 SIGN=-1.0                                                         GRI13330
      IF(RRY.LT.0.0)SIGN=+1.0                                           GRI13340
      APP=((RRY-NPFY/NPFZ*RRZ)/RRX)**2+1.0)+(NPFY/NPFZ)**2              GRI13350
      BPP=2.0*CCS(PSIR)/(RRX**2)*(RRY-NPFY/NPFZ*RRZ)                    GRI13360
      CPP=(COS(PSIR)/RRX)**2-1.0                                        GRI13370
      CLP=BPP/(2.0*APP)+SIGN*SQRT(BPP** 2-4.0*APP*CPP)/(2.0*APP)        GRI13380
      CMP=-NPFY/NPFZ*CLP                                                GRI13390
      CKP=(COS(PSIR)-(RRY-NPFY/NPFZ*RRZ)*CLP)/RPX                       GRI13400
      RETURN                                                            GRI13410
   50 SIGN=-1.0                                                         GRI13420
      IF(RRY.LT.0.0)SIGN=+1.0                                           GRI13430
      AA=NPFX*RRY-NPFY*RRX                                              GRI13440
      BB=NPFX*RRZ-NPFZ*RRX                                              GRI13450
      CC=NPFX*CCS(PSIR)                                                 GRI13460
      IF((ABS(EP)).GT.EPS)GO TO 60                                      GRI13470
      CLP=CC/AA                                                         GRI13480
      APP=(NPFZ/NPFX)**2+1.0                                            GRI13490
      BPP=NPFY*NPFZ/NPFX**2*CLP                                         GRI13500
      CPP=((NPFY/NPFX)**2+1.0)*CLP**2-1.0                               GRI13510
      CMP=-BPP/APP+SIGN*SQRT(BPP**2-APP*CPP)/APP                        GRI13520
      CKP=(-NPFY*CLP-NPFZ*CMP)/NPFX                                     GRI13530
      RETURN                                                            GRI13540
   60 AP=(NPFY/NPFX)**2+1.0                                             GRI13550
      BP=(NPFZ/NPFX)**2+1.0                                             GRI13560
      CP=2.0*NPFY*NPFZ/NPFX**2                                          GRI13570
      APP=AP+BP*(AA/BB)**2-CP*AA/BB                                     GRI13580
      BPP=2.0*AA*CC*PP/BB**2-CP*CC/BB                                   GRI13590
      CPP=BP*(CC/BB)**2-1.0                                             GRI13600
      CLP=BPP/(2.0*APP)+SIGN*SQRT(BPP** 2-4.0*APP*CPP)/(2.0*APP)        GRI13610
      CMP=CC/BB-AA/BB*CLP                                               GRI13620
      CKP=(-NPFY*CLP-NPFZ*CMP)/NPFX                                     GRI13630
      RETURN                                                            GRI13640
      END                                                               GRI13650
```

11. PRELIMINARY RESULTS

Table 1. Comparison of RMS Spot size for a homogeneous lens with the RMS Spot size for a GRIN lens.

α_p \ DIV	0	+0.05	-0.05
0.	0.0057336	0.0069021	0.005286
0.1	0.027424	0.027646	0.027327
0.2	0.06277	0.06288	0.06304
0.3	0.113431	0.11216	0.113245
0.4	0.18265	0.18287	0.18277

Note: DIV is the fractional variation of refractive index. α_p is the angle of incoming parallel rays relative to lens axis; α_p has dimensions of radians. The center of symmetry X_C was at -0.07 measured from the apex of the outer surface. The minus sign indicates that X_C is external to lens.

RESULTS FROM LENS

(ICASE = 1)

Input: $\alpha_p = 0.0, 0.2, 0.4$

SUMMARY OF RESULTS

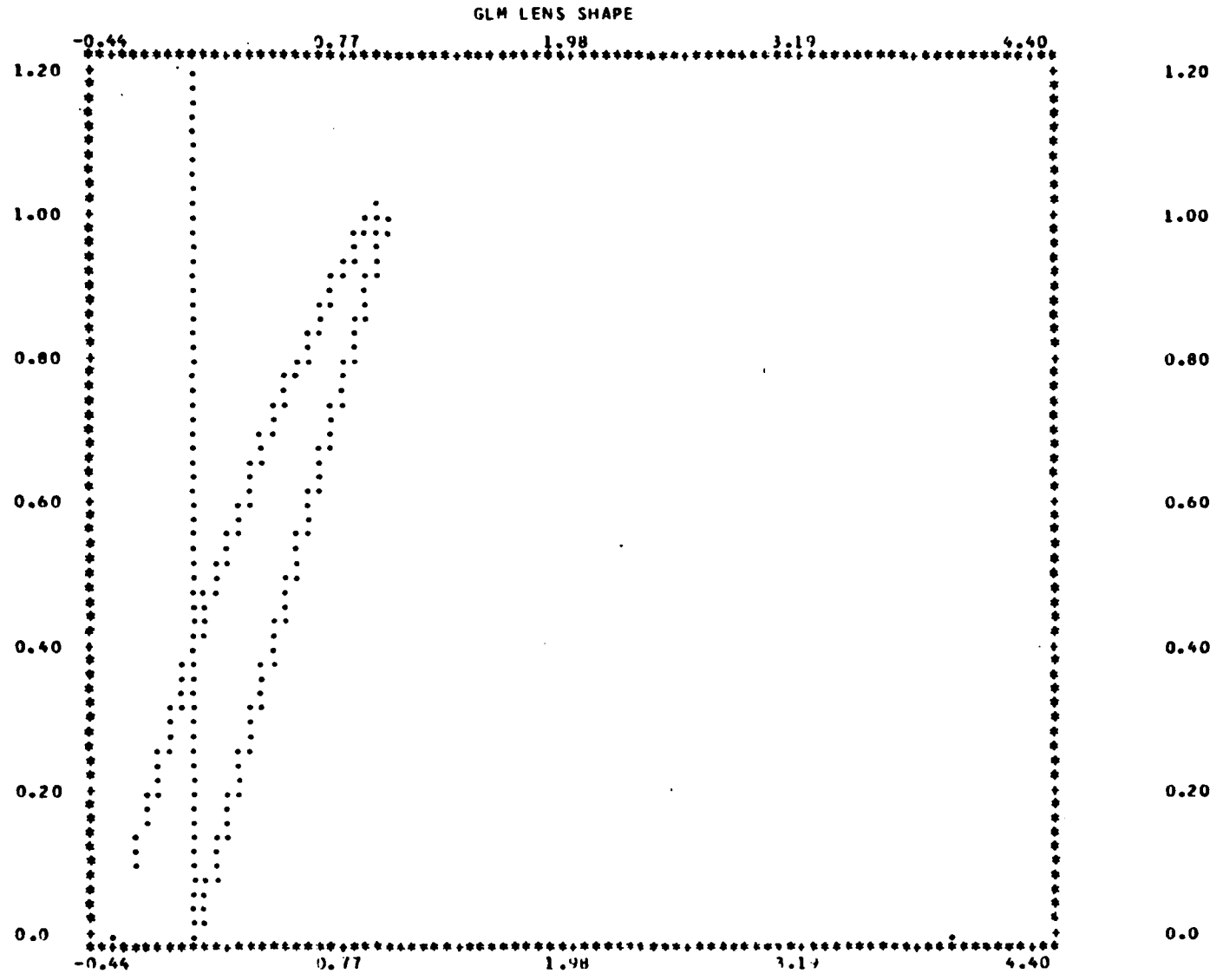
FOCAL LENGTH = 4.0000000 ALPHA = 0.7853979 U = 0.0 I = 1008

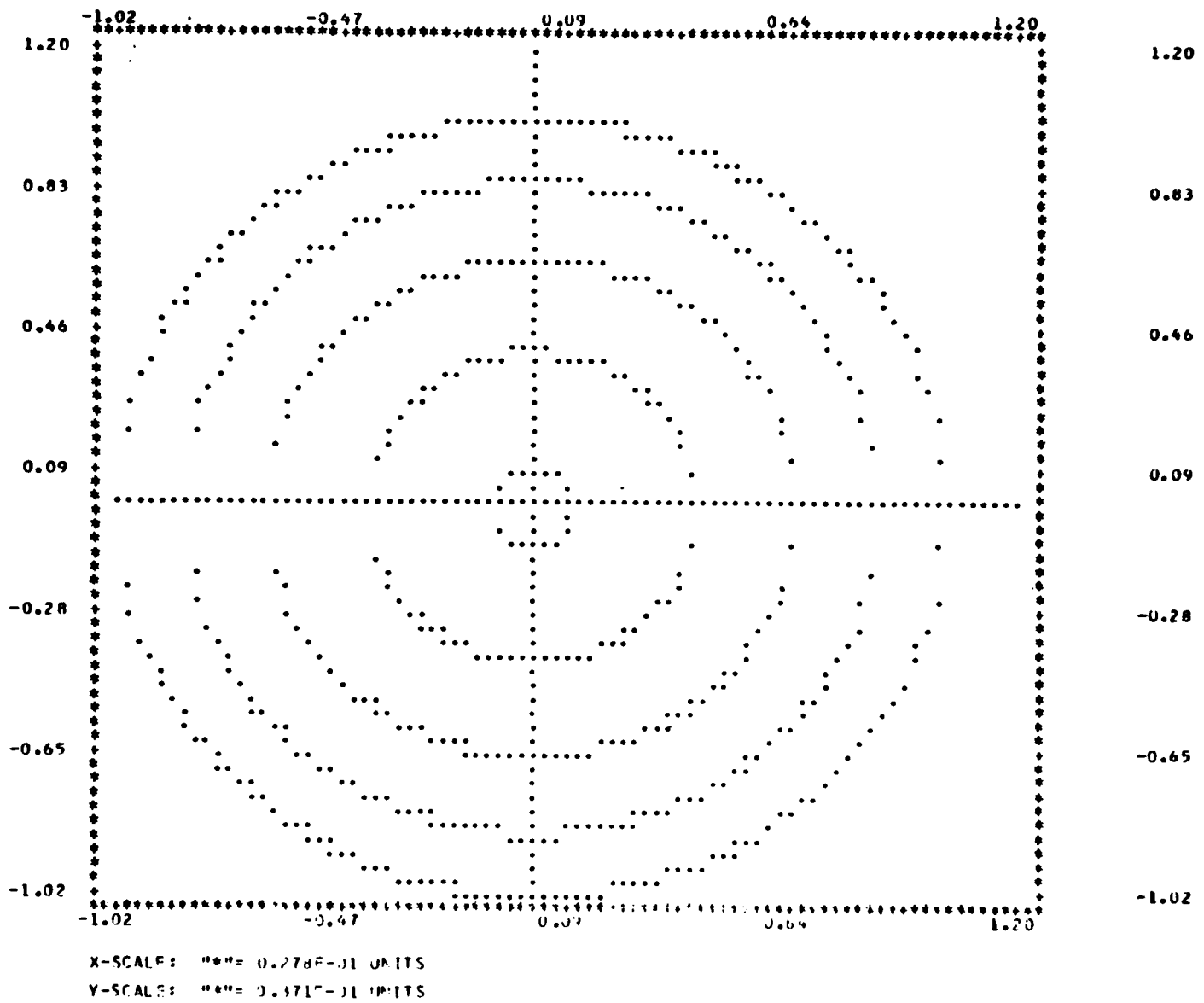
R = 1.0000000 T = 0.0500000 INDICES OF REFRACTION ARE: N1 = 1.0000000 N2 = 1.5000000 N3 = 1.0000000

ALFAP = 0.0 GRID = 0.1000000 STATNA = -0.44171 GAMMA = 0.7850314 XC=0.0 DIV=0.0

RAYS = 328 COUNT = 328 YCENTR = 0.0 SIGMAY = 0.0 SIGMAZ = 0.0

RMSRAD = 0.0000052


GLM LENS SHAPE
-0.44
0.77
1.98
3.19
4.40
1.20
1.00
0.80
0.60
0.40
0.20
0.0
X-SCALE: "*"= 0.605E-01 UNITS
Y-SCALE: "*"= 0.200E-01 UNITS


OBJECT PLANE
-1.02
-0.47
0.09
0.64
1.20
1.20
0.83
0.46
0.09
-0.28
-0.65
-1.02
X-SCALE: "*"= 0.278E-01 UNITS
Y-SCALE: "*"= 0.371E-01 UNITS

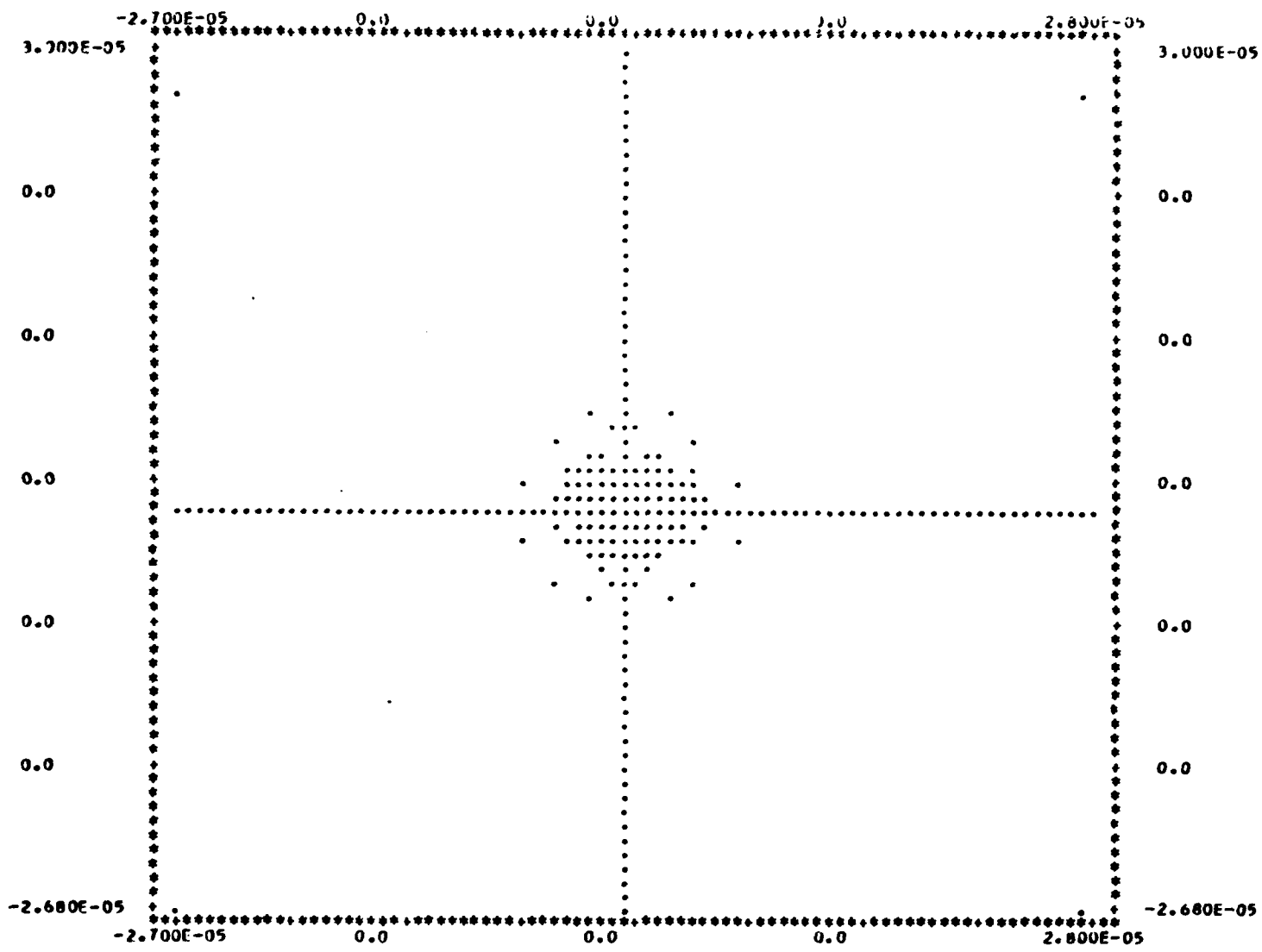


IMAGE PLANE
-2.700E-05
0.0
0.0
0.0
2.800E-05
3.000E-05
0.0
0.0
0.0
0.0
0.0
-2.680E-05
-2.700E-05
0.0
0.0
0.0
2.800E-05
X-SCALE: "*"= 0.687E-06 UNITS
Y-SCALE: "*"= 0.947E-06 UNITS

SUMMARY OF RESULTS

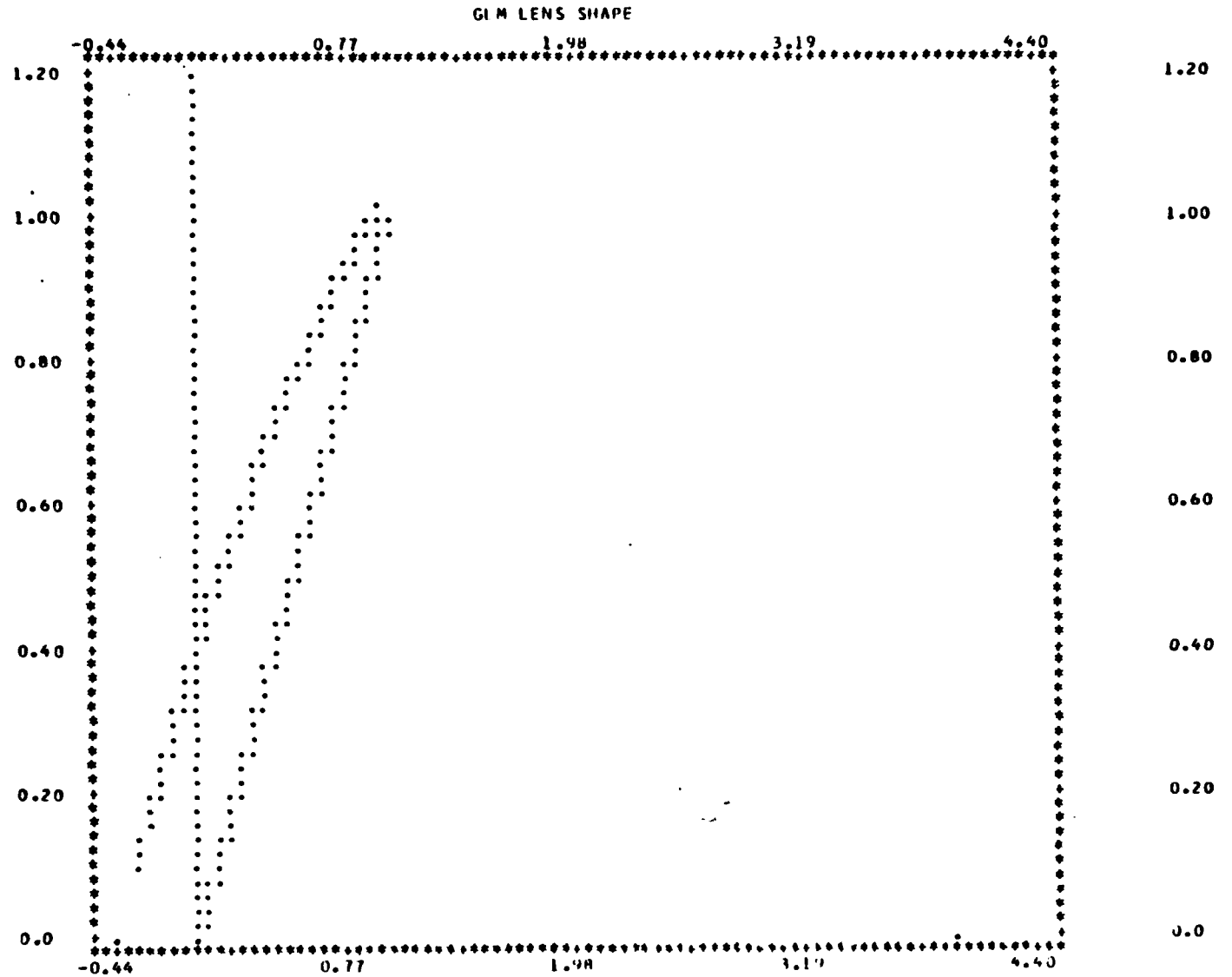
FOCAL LENGTH = 4.0000000 ALPHA = 0.7853979 U = 0.0 I = 1008

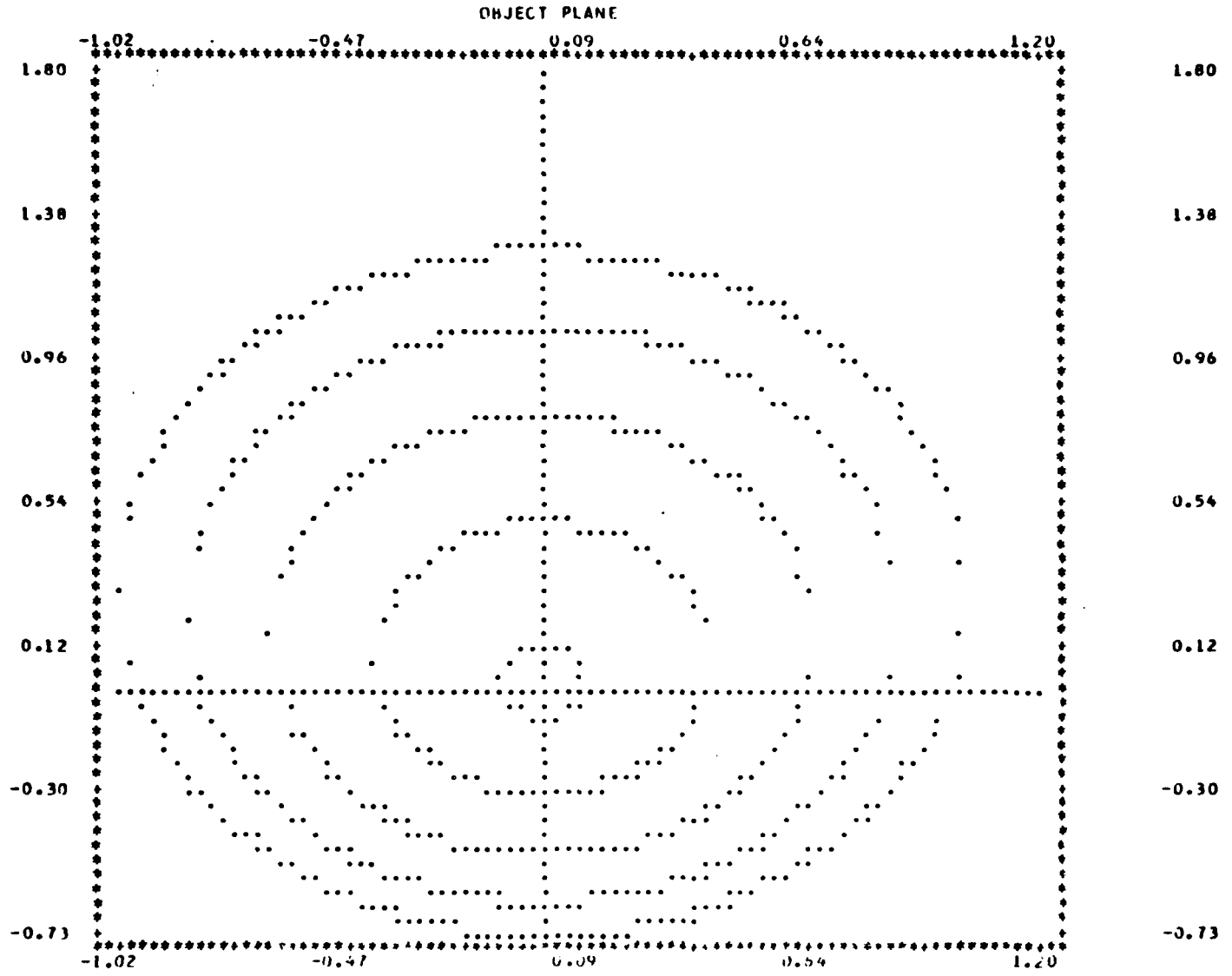
R = 1.0000000 T = 0.0500000 INDICES OF REFRACTION ARE: N1 = 1.0000000 N2 = 1.5000000 N3 = 1.0000000

ALFAP = 0.2000000 GRID = 0.1000000 STATNA = -0.44171 GAMMA = 0.7850314 XC=0.0 DIV=0.0

RAYS = 320 COUNT = 286 YCENTR = -0.6992106 SIGMAY = 0.0386393 SIGMAZ = 0.0164104

RMSRAD = 0.2346267


GLM LENS SHAPE
-0.44
0.77
1.98
3.19
4.40
1.20
1.00
0.80
0.60
0.40
0.20
0.0
X-SCALE: "*"= 0.605E-01 UNITS
Y-SCALE: "*"= 0.200E-01 UNITS


OBJECT PLANE
-1.02
-0.47
0.09
0.64
1.20
1.80
1.38
0.96
0.54
0.12
-0.30
-0.73
X-SCALE: "*"= 0.27[illegible]-01 UNITS
Y-SCALE: "*"= 0.42[illegible]-01 UNITS

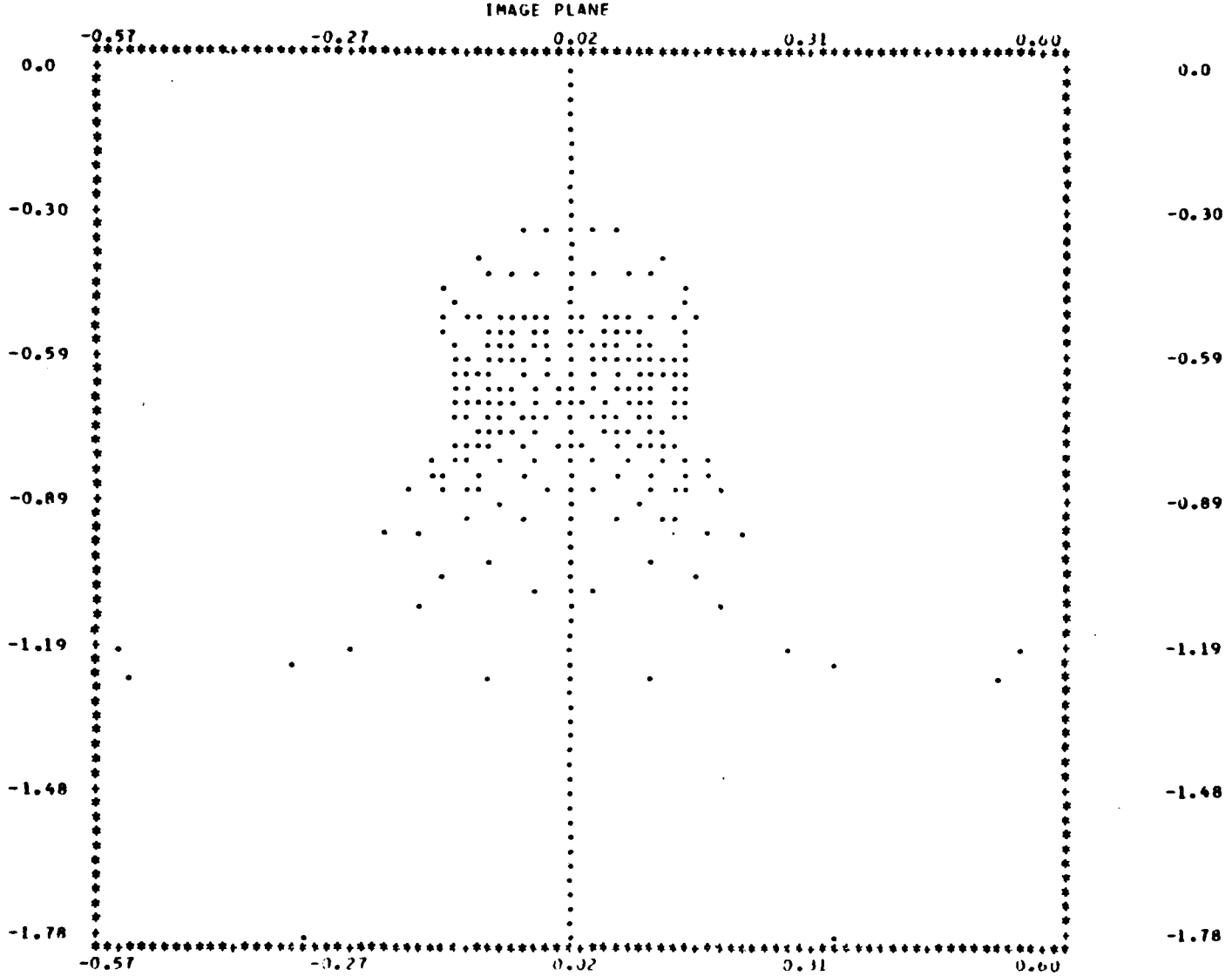
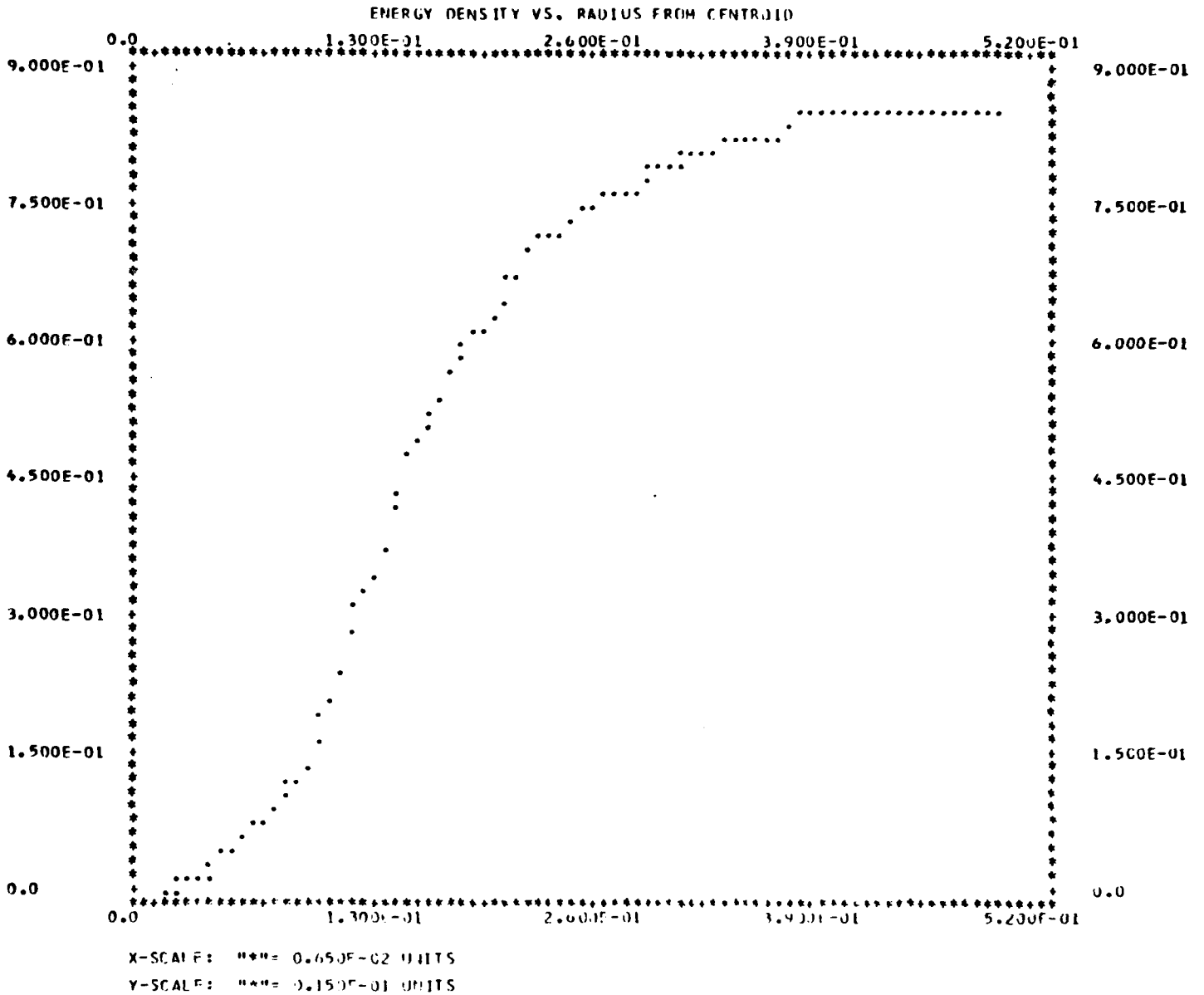


IMAGE PLANE
-0.57
-0.27
0.02
0.31
0.60
0.0
-0.30
-0.59
-0.89
-1.19
-1.48
-1.78
X-SCALE: "*"= 0.146E-01 UNITS
Y-SCALE: "*"= 0.297E-01 UNITS


ENERGY DENSITY VS. RADIUS FROM CENTROID
0.0
1.300E-01
2.600E-01
3.900E-01
5.200E-01
9.000E-01
7.500E-01
6.000E-01
4.500E-01
3.000E-01
1.500E-01
0.0
X-SCALE: "*"= 0.650E-02 UNITS
Y-SCALE: "*"= 0.150E-01 UNITS

SUMMARY OF RESULTS

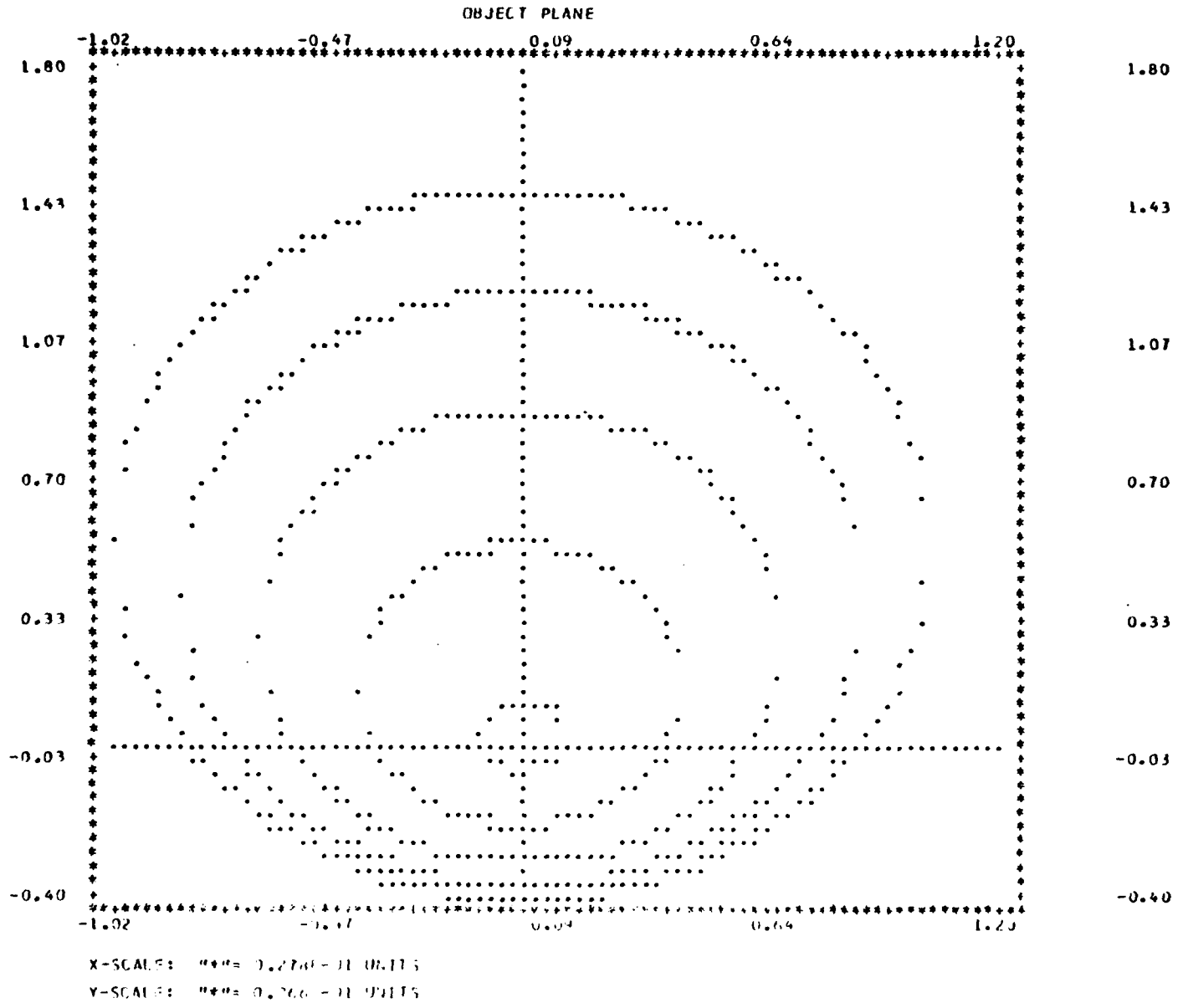
FOCAL LENGTH = 4.0000000 ALPHA = 0.7853979 U = 0.0 I = 1008

R = 1.0000000 T = 0.0500000 INDICES OF REFRACTION ARE: N1 = 1.0000000 N2 = 1.5000000 N3 = 1.0000000

ALFAP = 0.4000000 GRID = 0.1000000 STATNA = -0.44171 GAMMA = 0.7850314 XC=0.0 DIV=0.0

RAYS = 302 COUNT = 241 YCENTR = -1.4999914 SIGMAY = 0.1186211 SIGMAZ = 0.0549298

RMSRAD = 0.4165944


OBJECT PLANE
-1.02
-0.47
0.09
0.64
1.20
1.80
1.43
1.07
0.70
0.33
-0.03
-0.40
X-SCALE:
Y-SCALE:

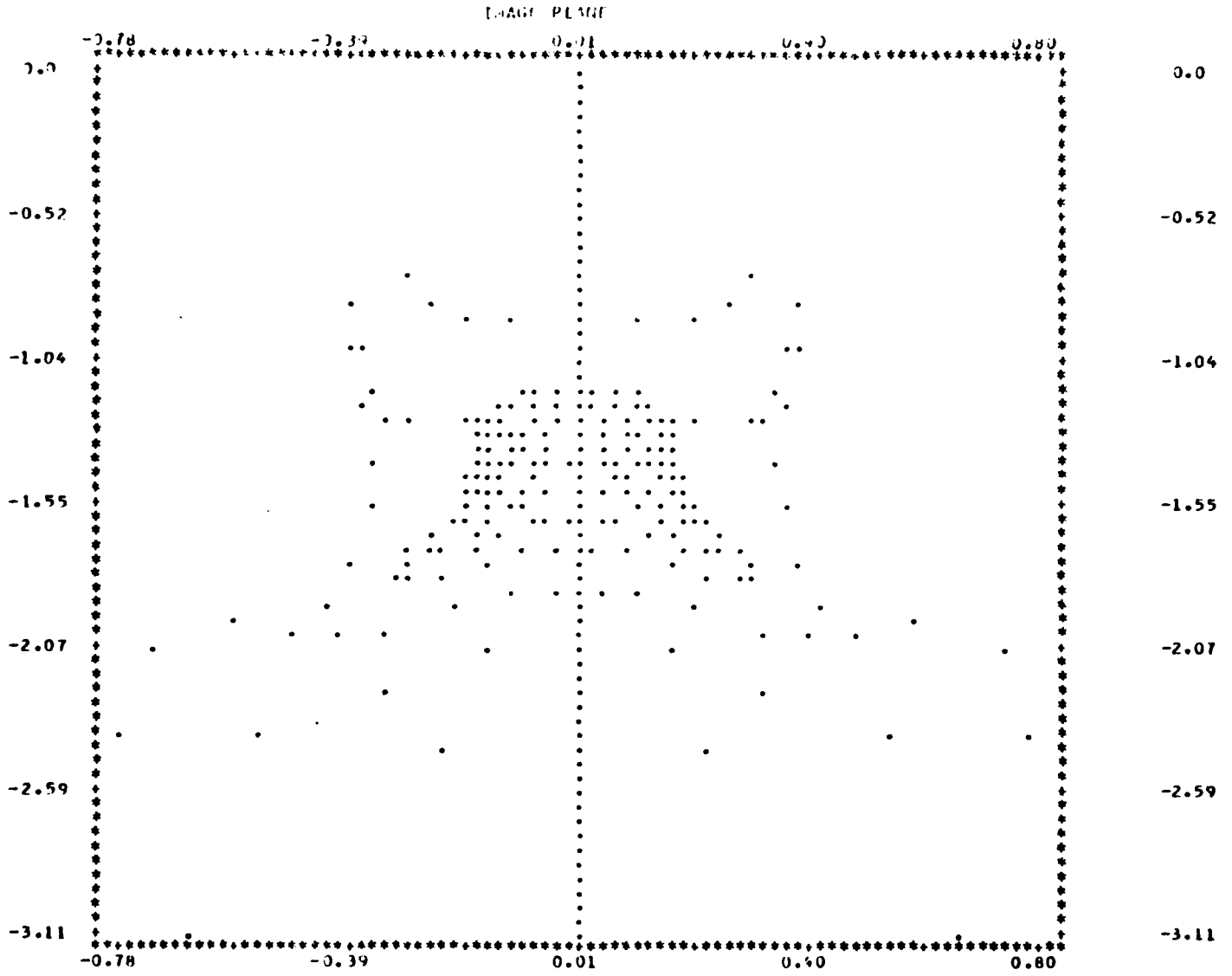
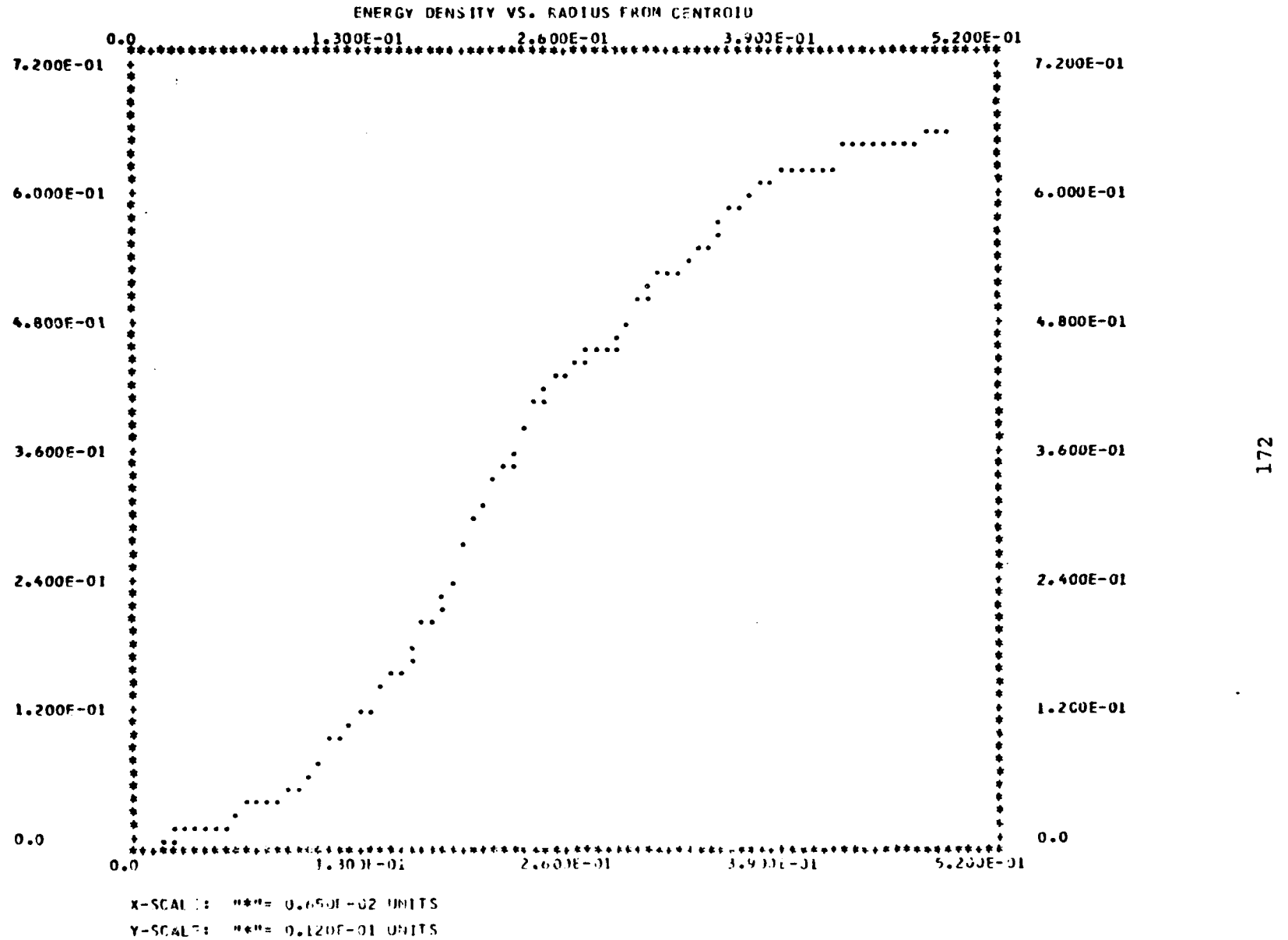


IMAGE PLANE
-0.78
-0.39
0.01
0.40
0.80
0.0
-0.52
-1.04
-1.55
-2.07
-2.59
-3.11
X-SCALE: "*"= 0.198E-01 UNITS
Y-SCALE: "*"= 0.518E-01 UNITS


ENERGY DENSITY VS. RADIUS FROM CENTROID
0.0
1.300E-01
2.600E-01
3.900E-01
5.200E-01
7.200E-01
6.000E-01
4.800E-01
3.600E-01
2.400E-01
1.200E-01
0.0
X-SCALE: "*"= 0.650E-02 UNITS
Y-SCALE: "*"= 0.120E-01 UNITS

RESULTS FROM GRIN

(ICASE = 2)

Input: X_c = -0.07, DIV = +0.05

α_p = 0.0, 0.1

SUMMARY OF RESULTS

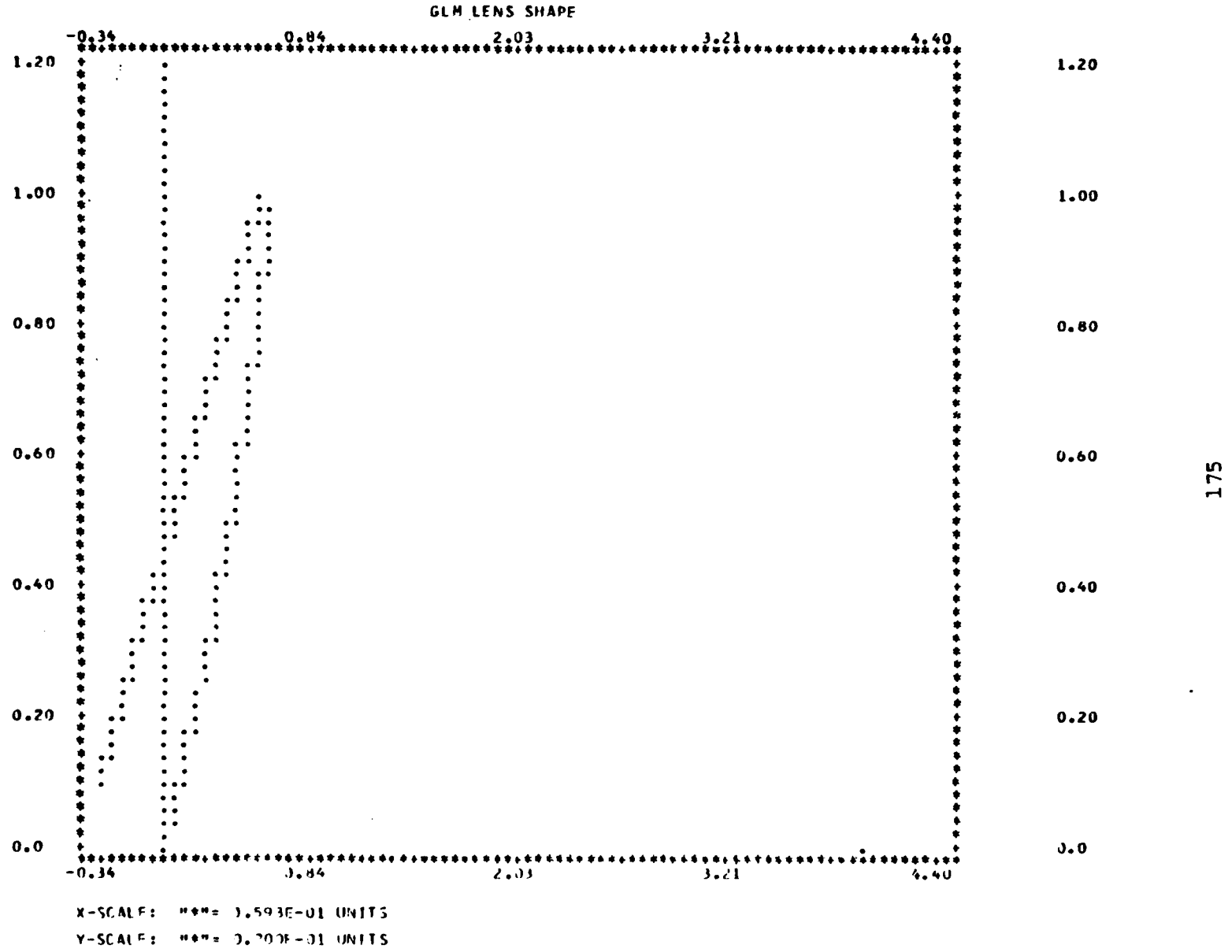
FOCAL LENGTH = 4.0000000 ALPHA = 0.7853979 U = 0.0 I = 1008

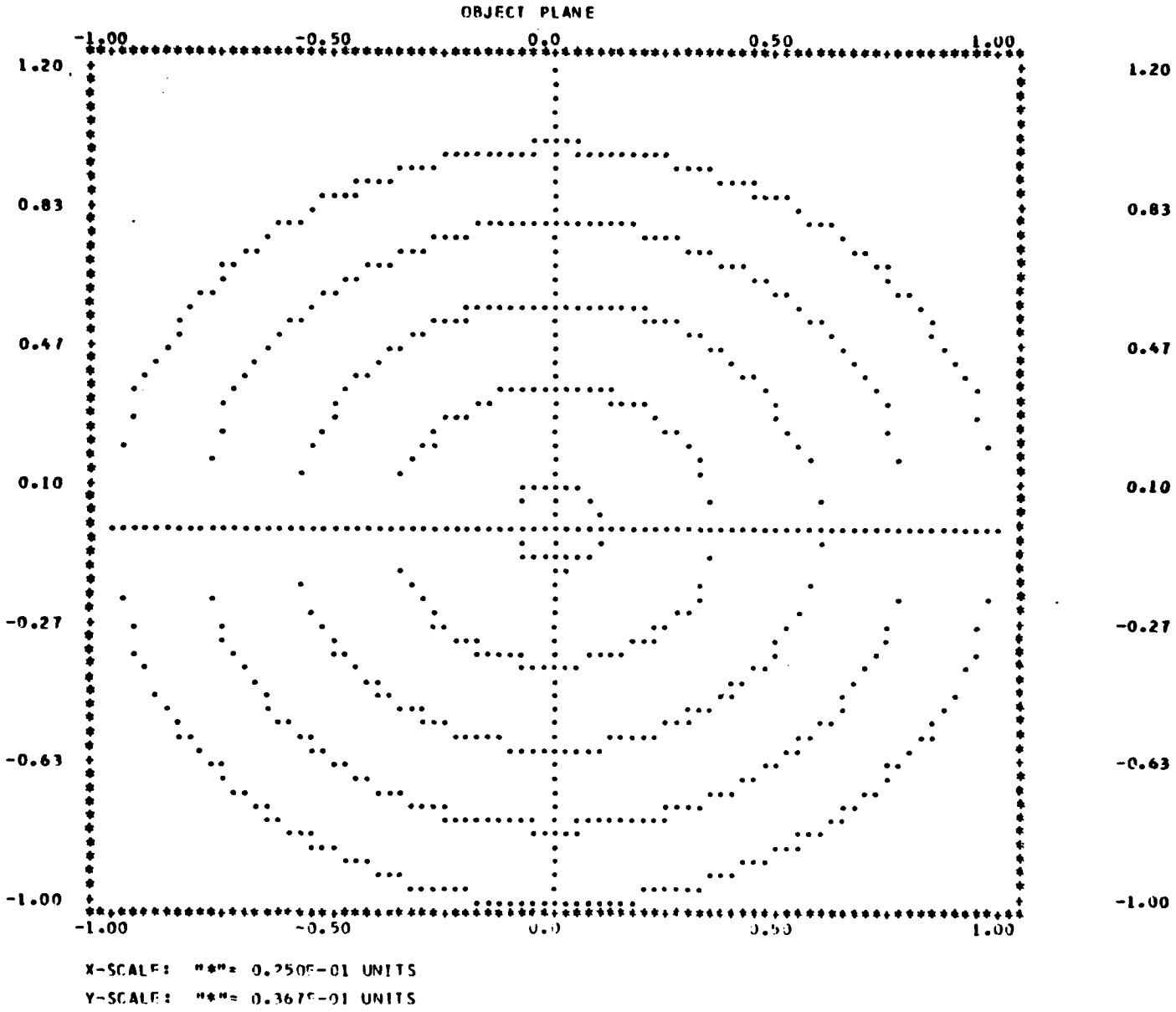
R = 1.0000000 T = 0.0500000 INDICES OF REFRACTION ARE: N1 = 1.0000000 N2 = 1.5757046 N3 = 1.0000000

ALFAP = 0.0 GRID = 0.1000000 STATNA = 0.0 GAMMA = 0.0 XC=-.51737 DIV=0.05000

RAYS = 310 COUNT = 310 YCENTR = 0.0030477 SIGMAY = 0.0000180 SIGMAZ = 0.0000297

RMSRAD = 0.0069021


GLM LENS SHAPE
-0.34
0.84
2.03
3.21
4.40
1.20
1.00
0.80
0.60
0.40
0.20
0.0
X-SCALE: ***= 3.593E-01 UNITS
Y-SCALE: ***= 3.703E-01 UNITS


OBJECT PLANE
-1.00
-0.50
0.0
0.50
1.00
1.20
0.83
0.47
0.10
-0.27
-0.63
-1.00
X-SCALE: "*"= 0.250E-01 UNITS
Y-SCALE: "*"= 0.367E-01 UNITS

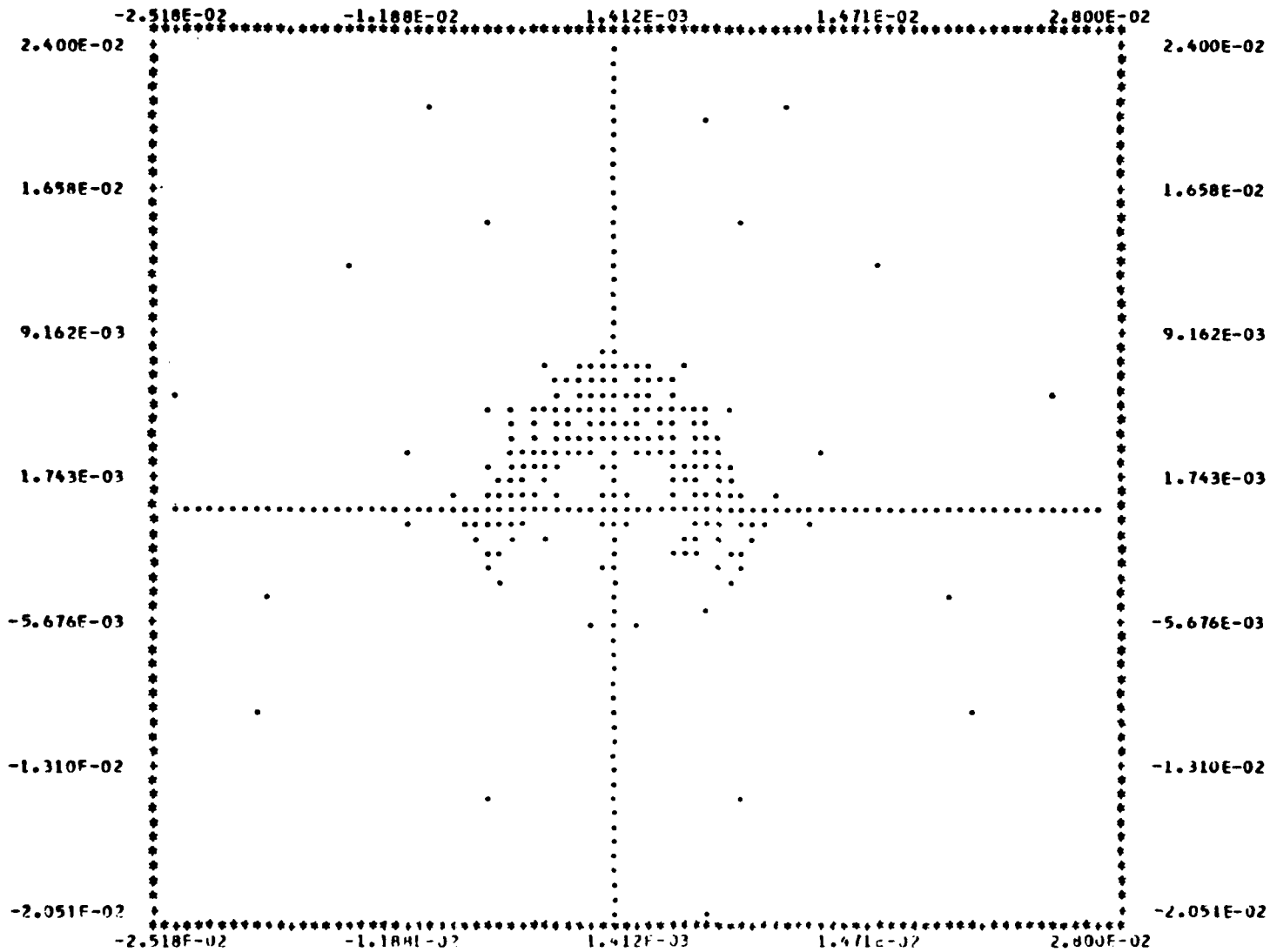
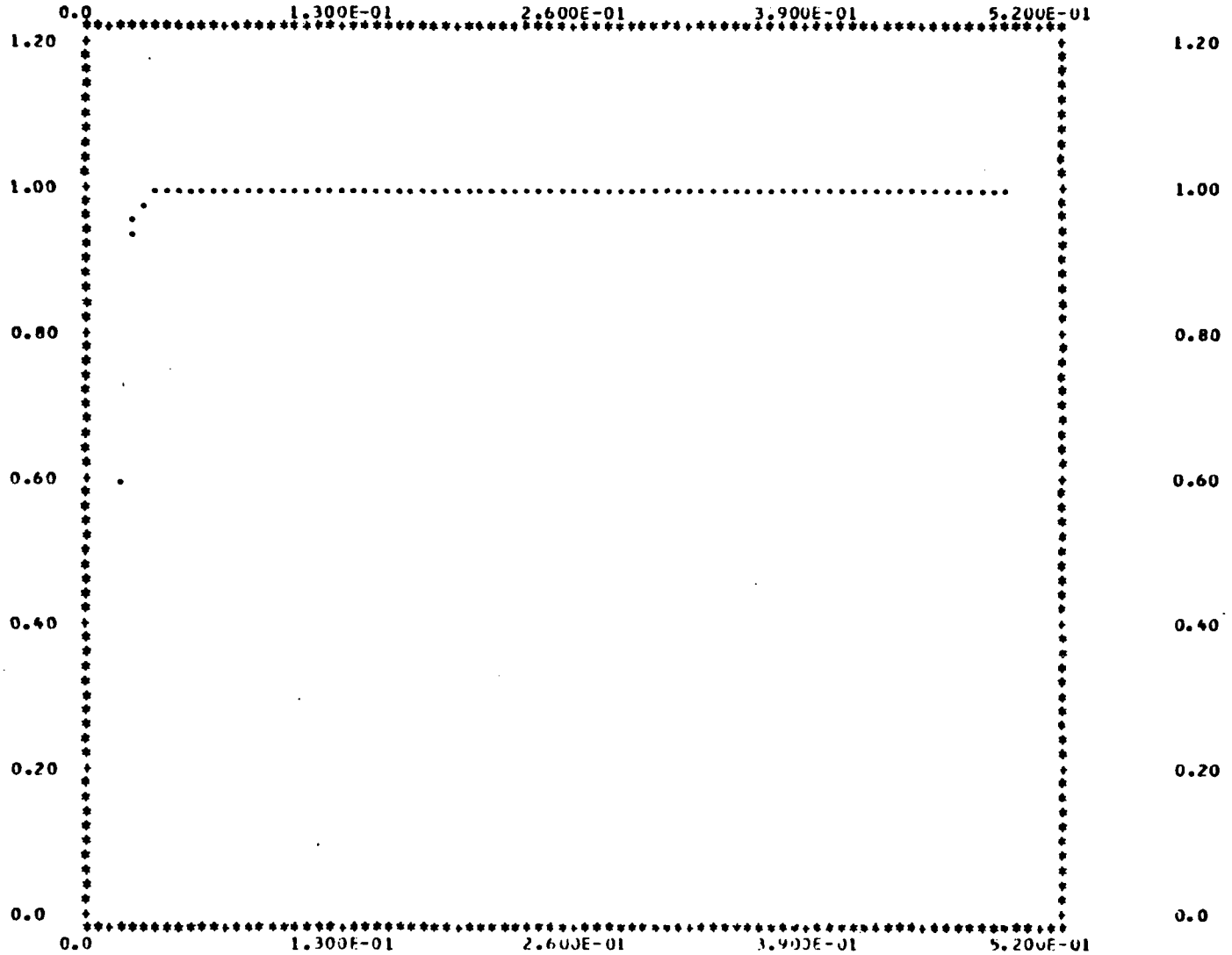


IMAGE PLANE
-2.518E-02
-1.188E-02
1.412E-03
1.471E-02
2.800E-02
2.400E-02
1.658E-02
9.162E-03
1.743E-03
-5.676E-03
-1.310E-02
-2.051E-02
X-SCALE: "*"= 0.665E-03 UNITS
Y-SCALE: "*"= 0.742E-03 UNITS


ENERGY DENSITY VS. RADIUS FROM CENTROID
0.0
1.300E-01
2.600E-01
3.900E-01
5.200E-01
1.20
1.00
0.80
0.60
0.40
0.20
0.0
X-SCALE: "*"= 0.650E-02 UNITS
Y-SCALE: "*"= 0.200E-01 UNITS

SUMMARY OF RESULTS

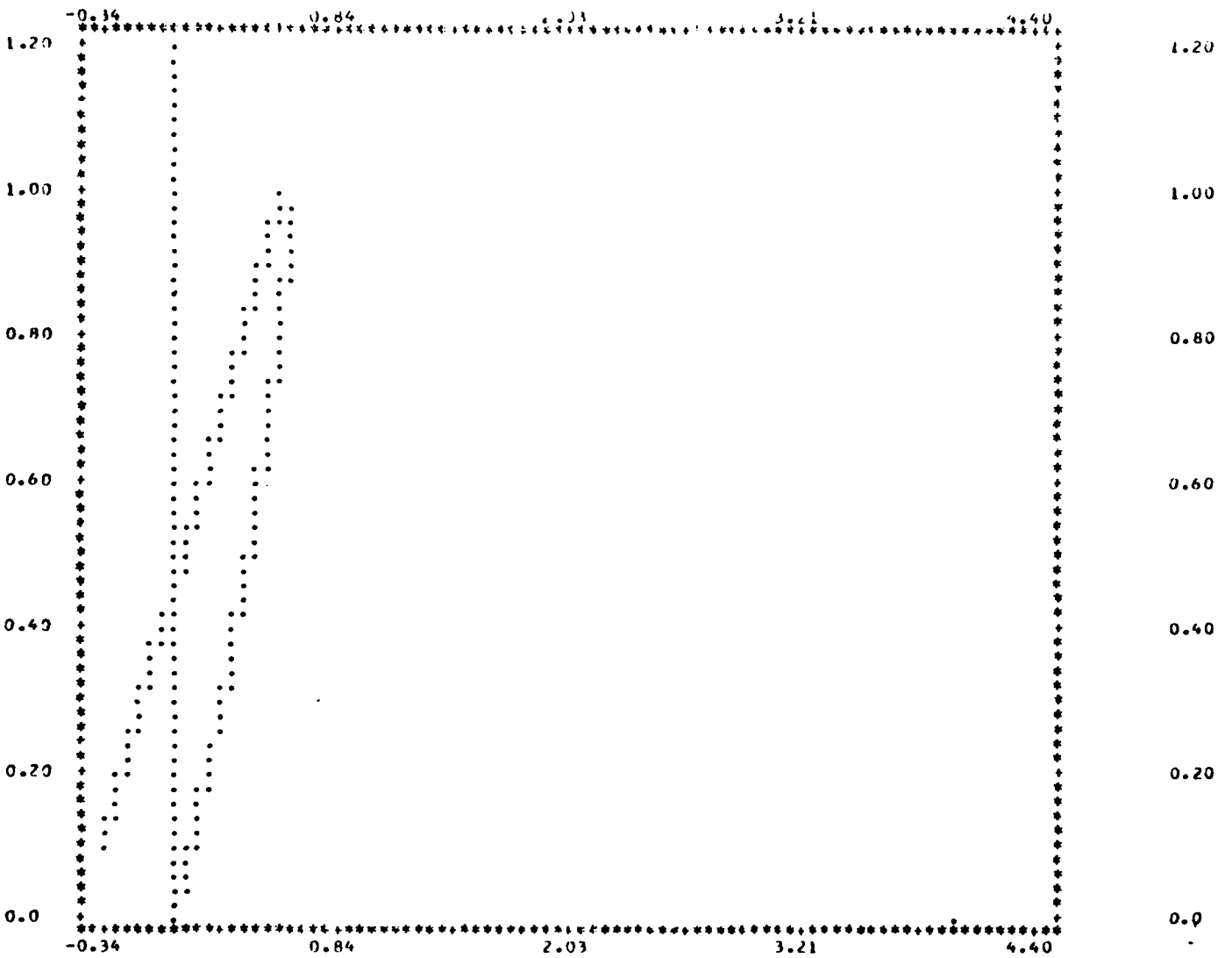
FOCAL LENGTH = 4.0000000 ALPHA = 0.7853979 U = 0.0 I = 1008

R = 1.0000000 T = 0.0500000 INDICES OF REFRACTION ARE: N1 = 1.0000000 N2 = 1.5602507 N3 = 1.0000000

ALFAP = 0.1000000 GRID = 0.1000000 STATNA = 0.0 GAMMA = 0.0 XC=-.51737 DIV=0.05000

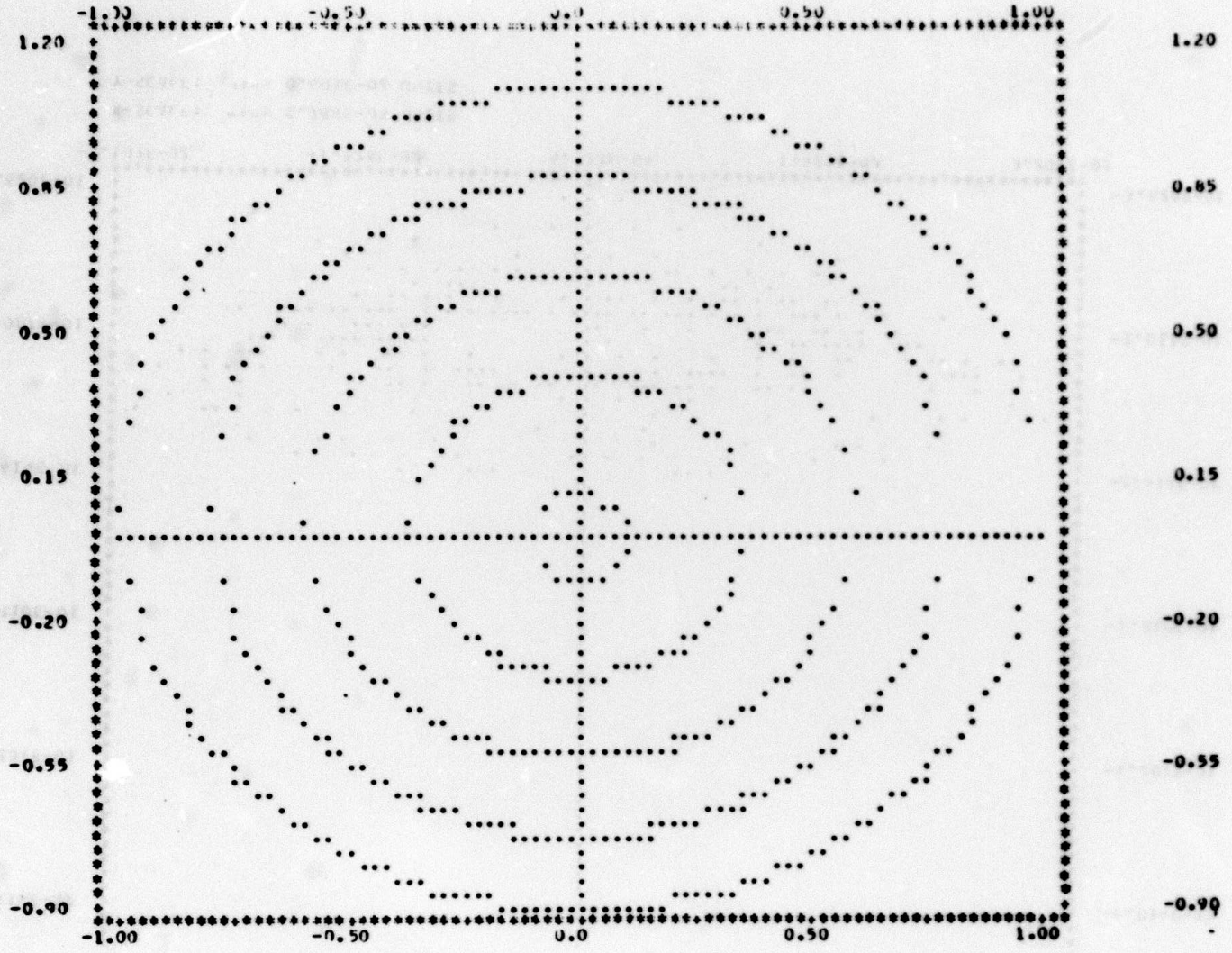
RAYS = 297 COUNT = 284 YCENTR = -0.2932486 SIGMAY = 0.0005434 SIGMAZ = 0.0002209

RMSRAD = 0.0276461



X-SCALE: "*"= 0.593E-01 UNITS

Y-SCALE: "*"= 0.200E-01 UNITS


OBJECT PLANE
-1.00
-0.50
0.0
0.50
1.00
1.20
0.85
0.50
0.15
-0.20
-0.55
-0.90
X-SCALE: "*"= 0.250E-01 UNITS
Y-SCALE: "*"= 0.349E-01 UNITS

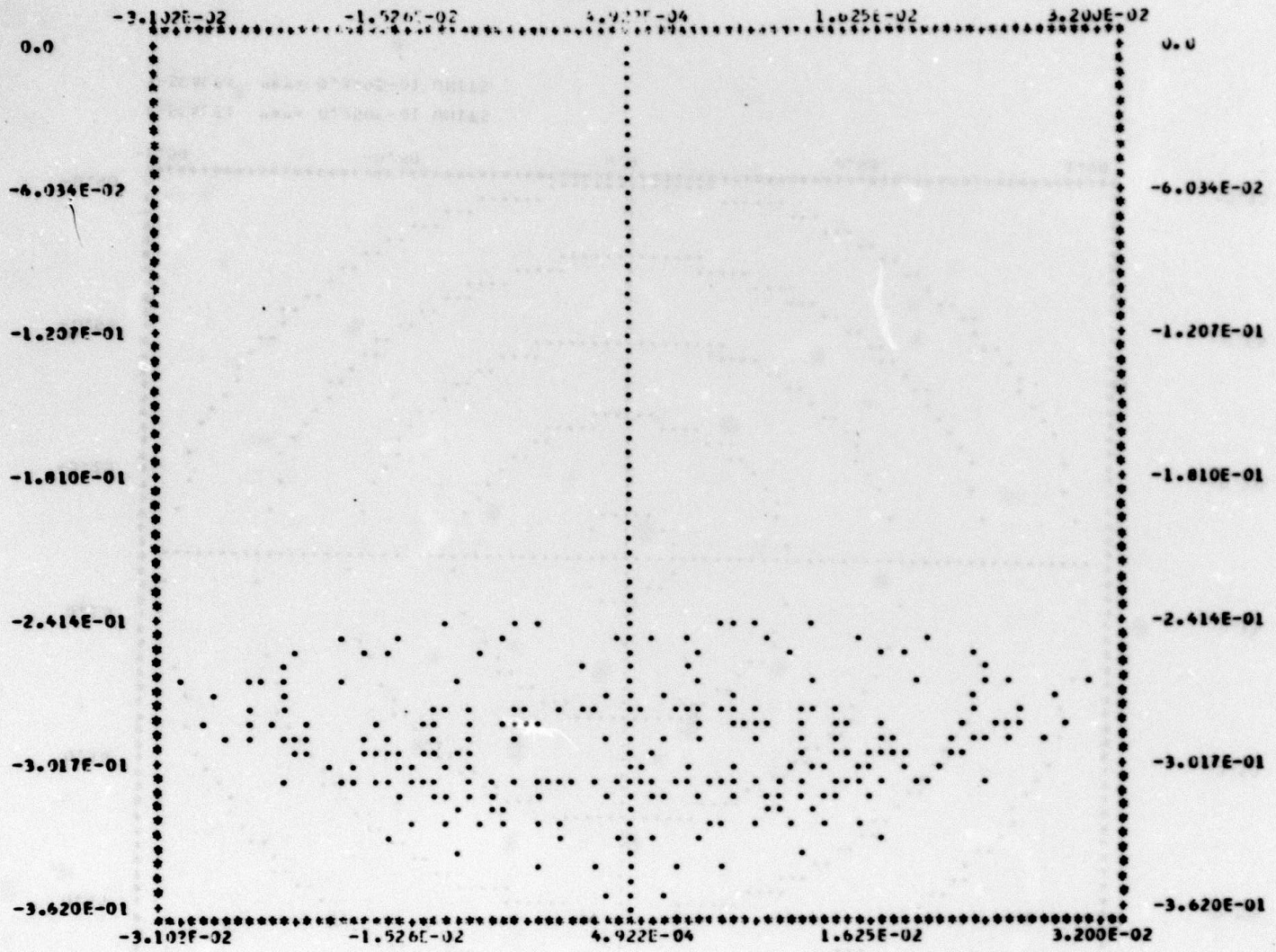
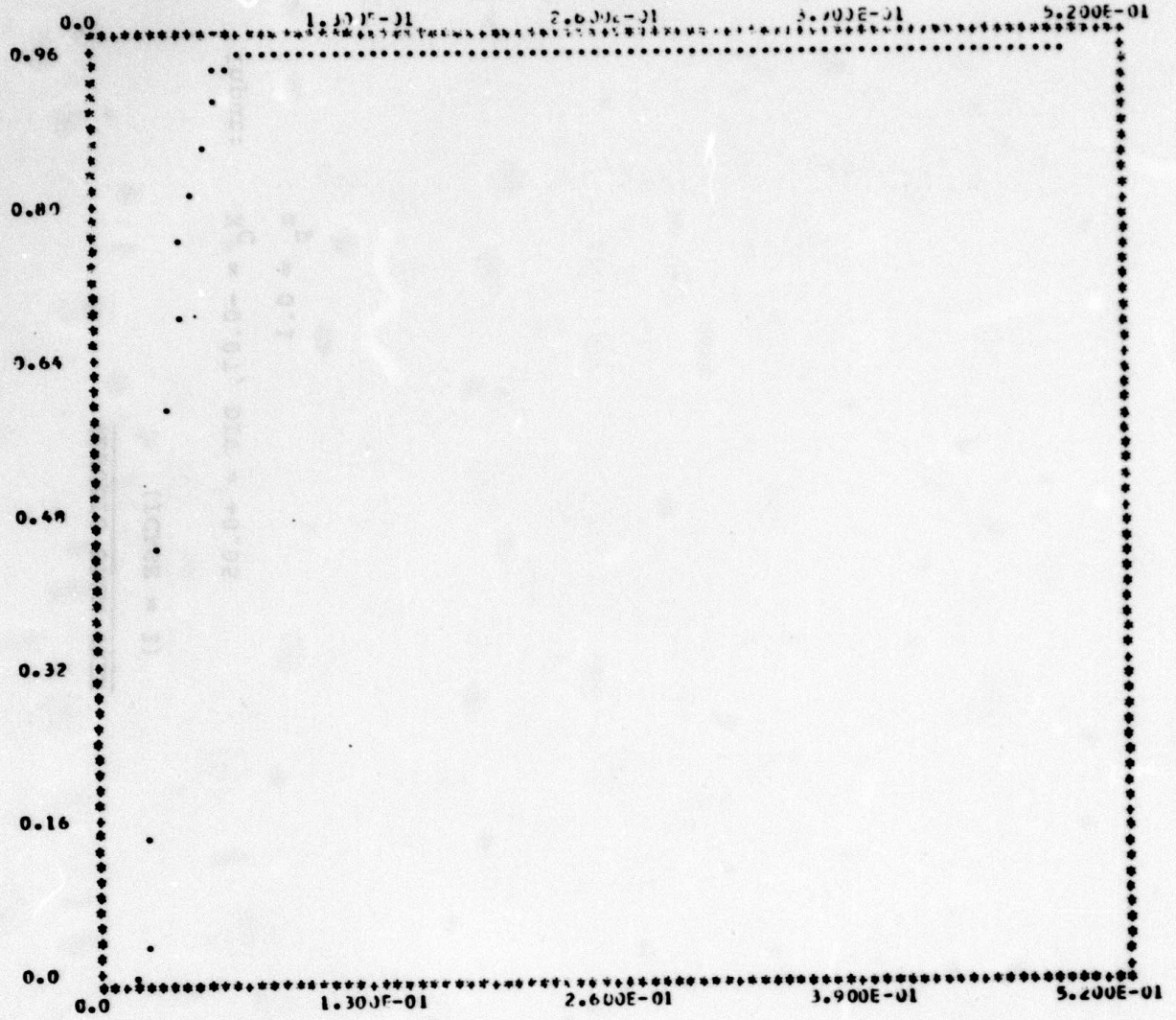


IMAGE PLANE
-3.102E-02
-1.526E-02
4.922E-04
1.625E-02
3.200E-02
0.0
-6.034E-02
-1.207E-01
-1.810E-01
-2.414E-01
-3.017E-01
-3.620E-01
X-SCALE: *** = 0.7805E-03 UNITS
Y-SCALE: *** = 0.6033E-02 UNITS


ENERGY DENSITY VS. RADIUS FROM CENTROID
0.0
1.300E-01
2.600E-01
3.900E-01
5.200E-01
0.96
0.80
0.64
0.48
0.32
0.16
0.0
X-SCALE: "*"= 0.650E-02 UNITS
Y-SCALE: "*"= 0.160E-01 UNITS

RESULTS FROM GRIN

(ICASE = 2)

Input: $X_c = -0.07$, DIV = +0.05

$\alpha_p = 0.1$

SUMMARY OF RESULTS

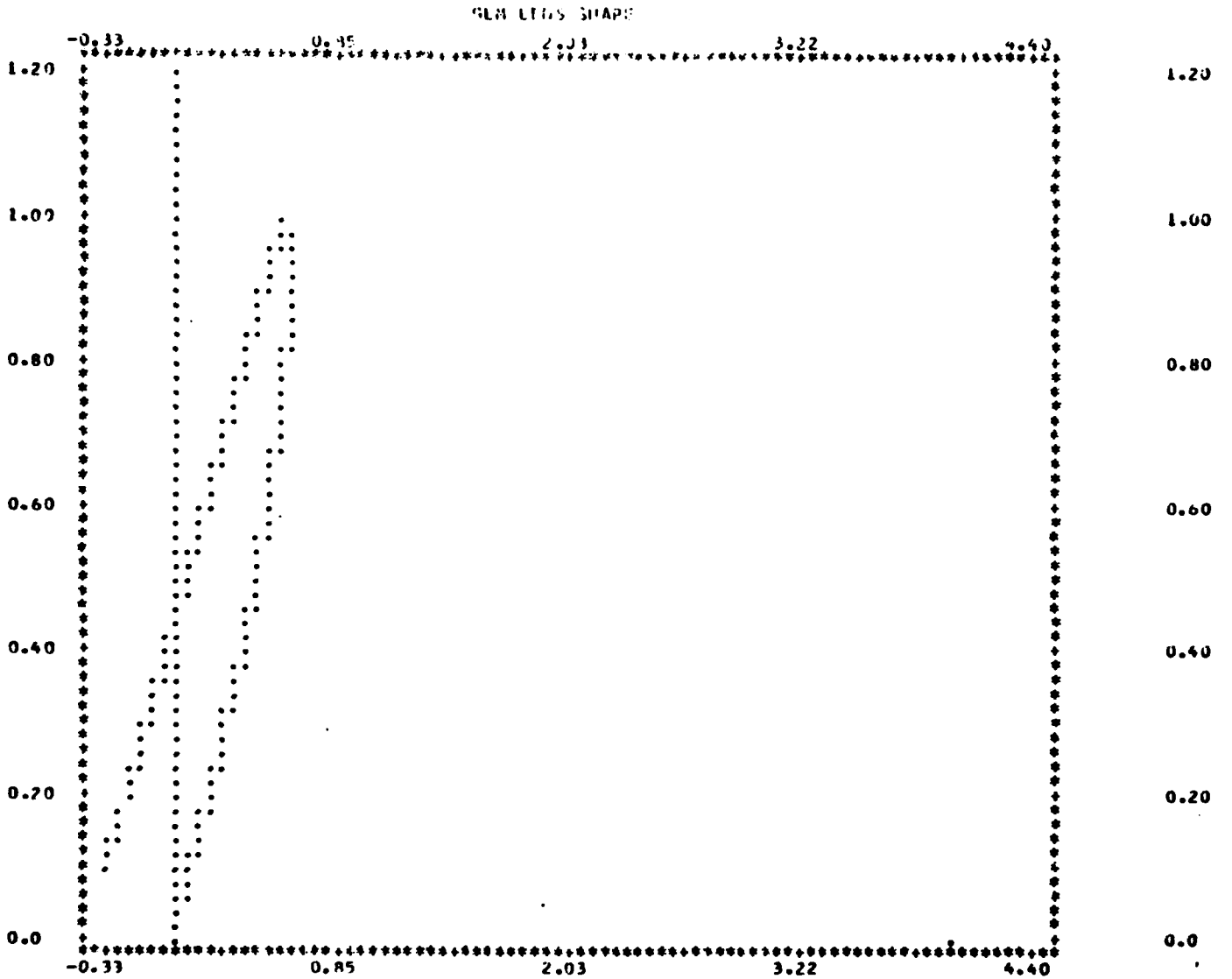
FOCAL LENGTH = 4.0000000 ALPHA = 0.7853979 U = 0.0 I = 1008

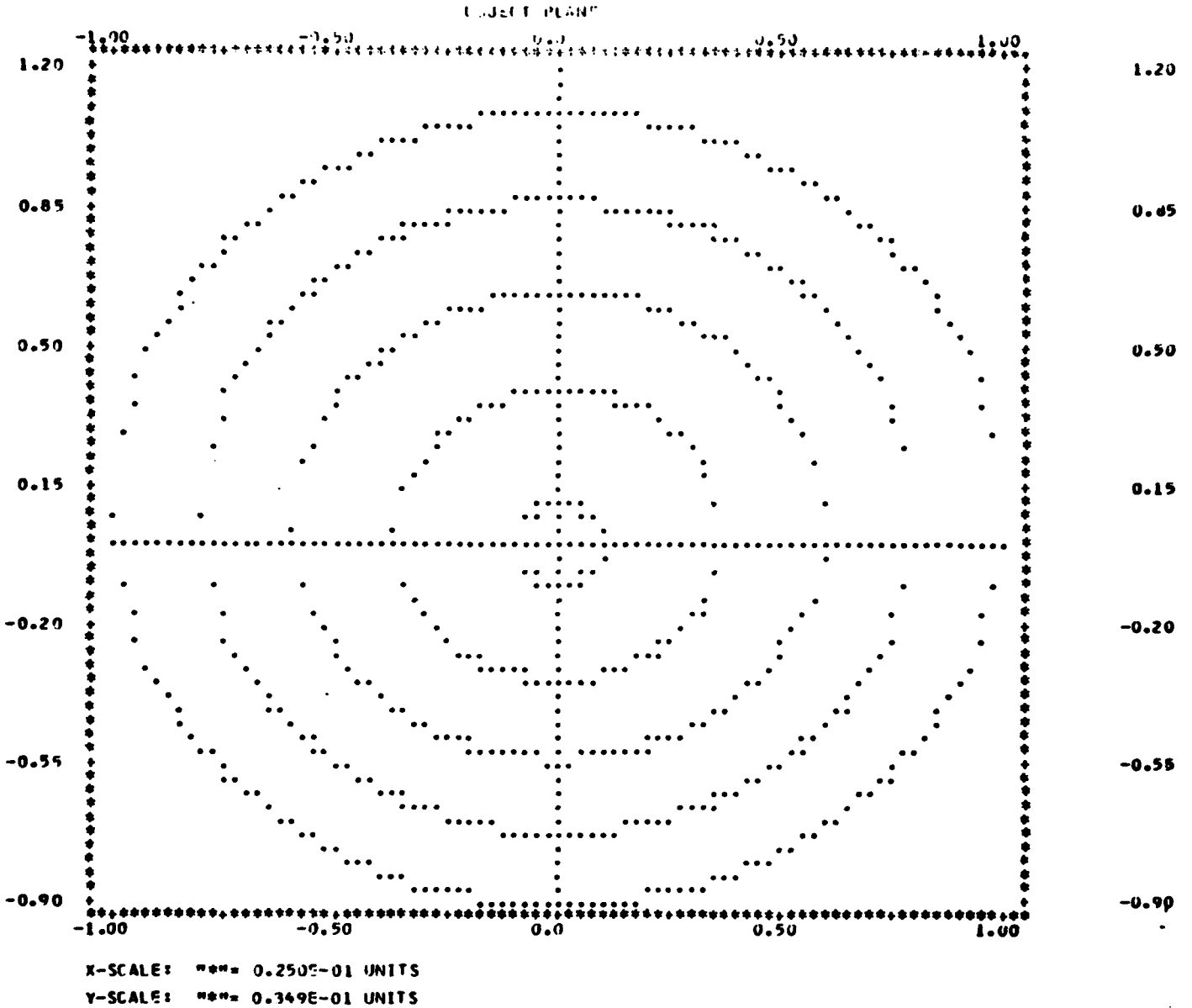
R = 1.0000000 T = 0.0500000 INDICES OF REFRACTION ARE N1 = 1.0000000 N2 = 1.4194584 N3 = 1.0000000

ALFAP = 0.1000000 GRID = 0.1000000 STATNA = 0.0 GAMMA = 0.0 XC=-.50618 DIV=-.05000

RAYS = 285 COUNT = 284 YCENTR = -0.2919591 SIGMAY = 0.0005272 SIGMAZ = 0.0002196

RMSRAD = 0.0273276


GLM LEDS SHAPE
-0.33
0.85
2.03
3.22
4.40
1.20
1.00
0.80
0.60
0.40
0.20
0.0
X-SCALE: "*"= 0.592E-01 UNITS
Y-SCALE: "*"= 0.200E-01 UNITS


OBJECT PLANE
-1.00
-0.50
0.0
0.50
1.00
1.20
0.85
0.50
0.15
-0.20
-0.55
-0.90
X-SCALE: **** 0.2505-01 UNITS
Y-SCALE: **** 0.349E-01 UNITS

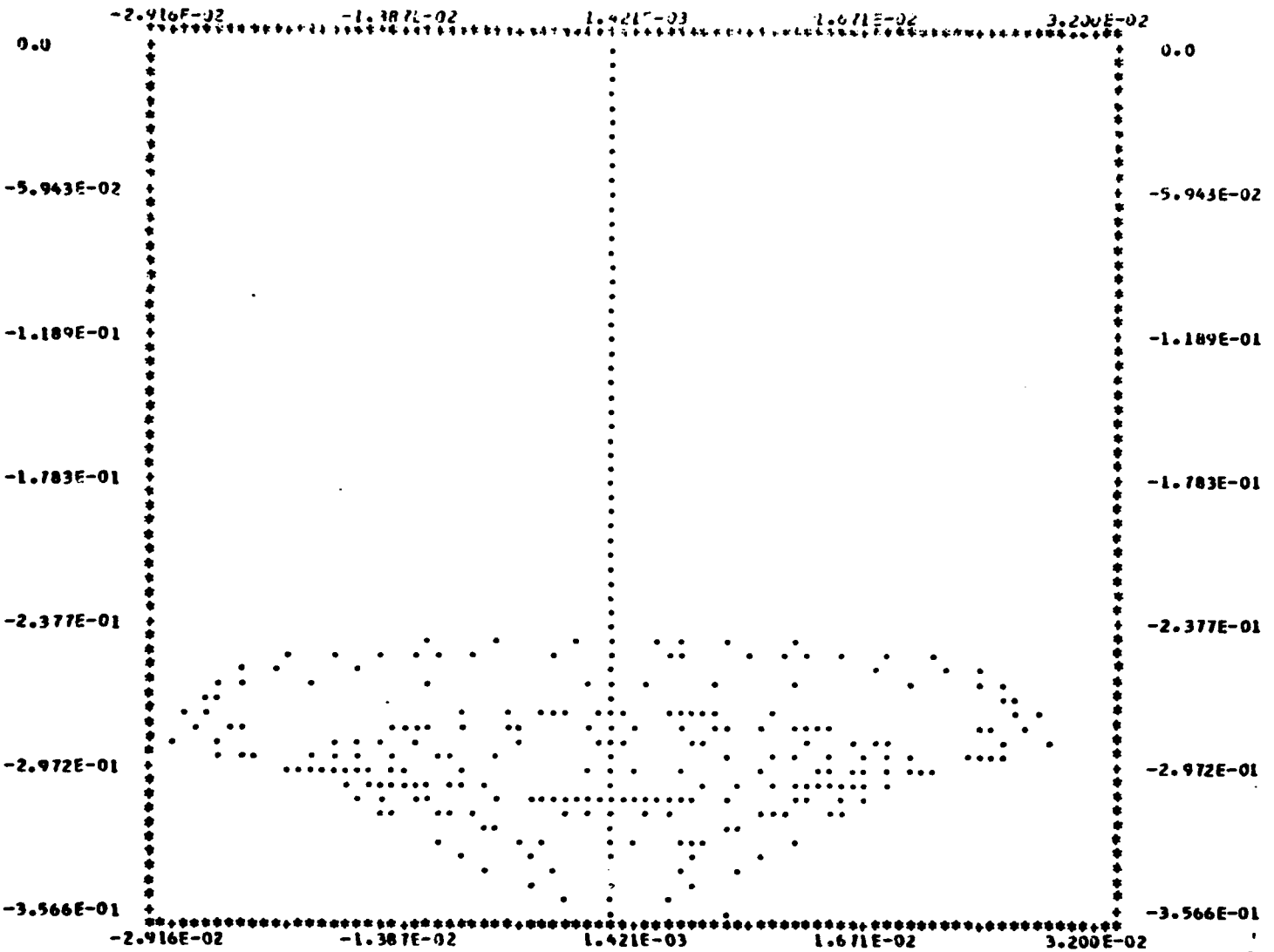
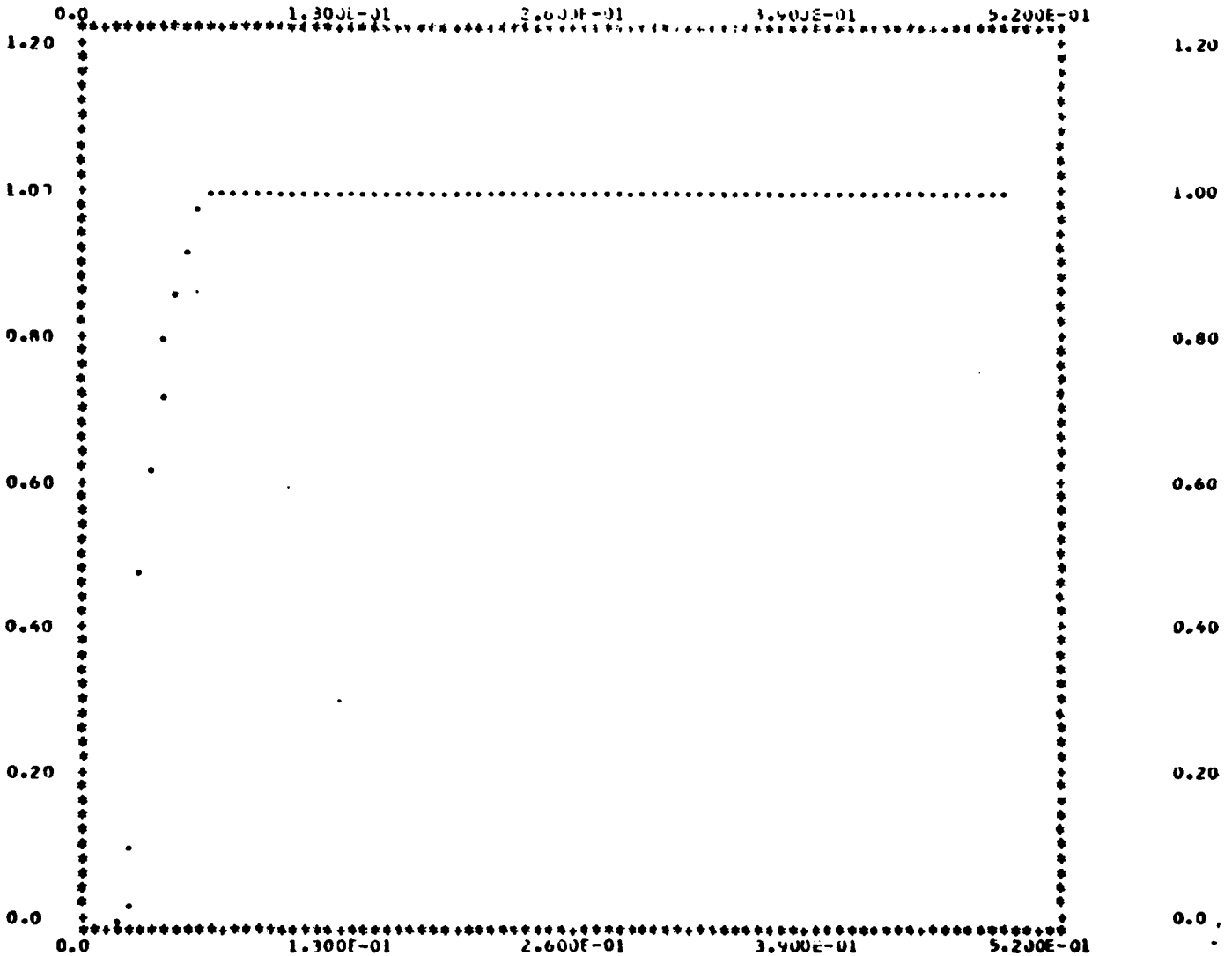


IMAGE PLANE
-2.916E-02
-1.387E-02
1.421E-03
1.671E-02
3.200E-02
0.0
-5.943E-02
-1.189E-01
-1.783E-01
-2.377E-01
-2.972E-01
-3.566E-01
X-SCALE: "*"= 0.764E-03 UNITS
Y-SCALE: "*"= 0.594E-02 UNITS


ENERGY DENSITY VS. RADIUS FROM CENTER (R)
0.0
1.300E-01
2.600E-01
3.900E-01
5.200E-01
1.20
1.00
0.80
0.60
0.40
0.20
0.0
X-SCALE: "*"= 0.650E-02 UNITS
Y-SCALE: "*"= 0.200E-01 UNITS

RESULTS FROM GRIN

1. Checkup for the homogeneous case.

* GRIN PARAMETERS(2):

ALPHA = 0.7853979 BETA = 0.3222679 RADIUS = 1.00000 INCIDENT ANGLE = 0.0 ITERATIONS = 1000

EDGE THICKNESS = 0.0500000 INDICES OF REFRACTION: N1 = 1.00000 N2 = 1.50000 N3 = 1.00000

FOCAL LENGTH FROM STATION ZERO = 4.00000 DELTA BETA= 0.00032

CENTER OF SYM(XC)=-0.07000 CHANGE IN N2(%)= 0.0 ALFAP= 0.0

NOTE:X-COORDINATES HAS BEEN SHIFTED IN CASE=2 BY X2(K);NOW,X2(K)=0.0 ETC.

J	X1	Y1	X2	Y2	BETA	I2P	I2	ETA	T	I1P	I1	DYDXT
	E	THETAE	THETA0	PSI	PSI0	RR	RF					
	0.44158	0.61444	3.55802	-0.51198								

ISKEW RAY TRACE PARAMETERS:

ALFAP= 0.0 GRID= 0.1000000 SEE LENS PARAMETERS ABOVE.

RAY	RAYY	RAYZ	XO	YO	XI	YI	ZI	OPL	YIN	ZIN	NTNCTY	XDIAPT	YDIAPT
	PHII	PHIIP	CKPP	CLPP	CMPP	D3	D1	NUM6	NUM7	NUM8			
1	0.0	0.20000	-0.24198	0.0	0.09462	0.0	0.09789	4.24782	0.0	-0.01990	1.00000	-0.143E+00	0.0
	0.4496	0.7101	0.9994	0.0	-0.0340	3.4654	0.4420	0.2000	0.0	-0.5926			
2	0.0	0.30000	-0.14198	0.0	0.18629	0.0	0.20042	4.18231	0.0	-0.00399	1.00000	0.376E+00	0.0
	0.4143	0.6482	0.9982	0.0	-0.0605	3.3779	0.4420	0.3000	0.0	-0.5760			
3	0.0	0.40000	-0.04198	0.0	0.27181	0.00122	0.30482	4.10801	0.00574	-0.00267	1.00000	0.413E+00	0.571E-02
	0.3668	0.5681	0.9957	0.0014	-0.0932	3.3005	0.4420	0.4000	0.0	-0.5573			
4	0.0	0.50000	0.05802	0.0	0.35019	0.00091	0.41138	4.02959	0.00312	-0.00140	1.00000	0.431E+00	0.312E-02
	0.3121	0.4786	0.9918	0.0007	-0.1276	3.2343	0.4420	0.5000	0.0	-0.5399			
5	0.0	0.60000	0.15802	0.0	0.42091	0.00138	0.52126	3.94930	0.00367	-0.00220	1.00000	0.429E+00	0.366E-02
	0.2487	0.3782	0.9864	0.0007	-0.1643	3.1813	0.4420	0.6000	0.0	-0.5245			
6	0.0	0.70000	0.25802	0.0	0.48317	0.00226	0.63179	3.86772	0.00490	-0.00325	1.00000	0.441E+00	0.490E-02
	0.1799	0.2717	0.9795	0.0008	-0.2013	3.1391	0.4420	0.7000	0.0	-0.5125			
7	0.0	0.80000	0.35802	0.0	0.53638	0.00285	0.74599	3.78667	0.00516	-0.00307	1.00000	0.430E+00	0.515E-02
	0.1024	0.1540	0.9706	0.0007	-0.2406	3.1131	0.4420	0.8000	0.0	-0.5040			
8	0.0	0.90000	0.45802	0.0	0.59029	0.00411	0.86291	3.70409	0.00643	-0.00398	1.00000	0.439E+00	0.643E-02
	0.0244	0.0365	0.9604	0.0007	-0.2786	3.1005	0.4420	0.9000	0.0	-0.5002			
9	0.10000	0.10000	-0.30256	0.10000	0.33821	0.02734	0.02734	4.27621	-0.01341	-0.01343	1.00000	-0.718E+00	0.129E-04
	0.4716	0.7497	0.9969	-0.0116	-0.0116	3.5203	0.4420	0.1414	0.1000	-0.6044			
10	0.10000	0.21000	-0.21837	0.10000	0.11679	0.05453	0.11936	4.23378	-0.00747	-0.01495	1.00000	0.271E-01	0.238E-05
	0.4415	0.6958	0.9952	-0.0180	-0.0369	3.4440	0.4420	0.2236	0.1000	-0.5886			
11	0.10000	0.30000	-0.12575	0.10000	0.20656	0.06914	0.20654	4.17058	0.00061	-0.00819	1.00000	0.314E+00	0.322E-02
	0.4055	0.6331	0.9918	-0.0204	-0.0536	3.3649	0.4420	0.3162	0.1000	-0.5722			
12	0.10000	0.40000	-0.02967	0.10000	0.28181	0.07762	0.30820	4.09841	0.00212	-0.00178	1.00000	0.423E+00	0.255E-02
	0.3611	0.5585	0.9953	-0.0229	-0.0942	3.2917	0.4420	0.4123	0.1000	-0.5552			
13	0.10000	0.50000	0.06792	0.10000	0.35757	0.08399	0.41361	4.02145	0.00404	-0.00695	1.00000	0.435E+00	0.423E-02
	0.3068	0.4702	0.9914	-0.0248	-0.1284	3.2282	0.4420	0.5099	0.1000	-0.5385			
14	0.10000	0.60000	0.16630	0.10000	0.42646	0.08966	0.52172	3.94261	0.00652	-0.00324	1.00000	0.423E+00	0.704E-02
	0.2433	0.3697	0.9859	-0.0262	-0.1653	3.1763	0.4420	0.6083	0.1000	-0.5234			
15	0.10000	0.70000	0.26513	0.10000	0.48736	0.09275	0.63297	3.86242	0.00445	-0.00324	1.00000	0.426E+00	0.494E-02

	0.1733	C.2616	0.9788	-0.0281	-0.2028	3.1372	0.4420	0.7071	0.1000	-0.5116				
16	0.10000	0.80000	0.36424	0.10000	0.53541	0.09649	0.74689	3.78137	0.00526	-0.00283	1.00000	0.431E+00	0.561E-02	
	0.0981	0.1475	0.9701	-0.0253	-0.2409	3.1117	0.4420	0.8062	0.1000	-0.5036				
17	0.10000	0.90000	0.46356	0.10000	0.58247	0.09989	0.86372	3.69886	0.00617	0.00074	1.00000	0.445E+00	0.609E-02	
	0.0214	0.0320	0.9600	-0.0302	-0.2784	3.0996	0.4420	0.9055	0.1000	-0.5002				
18	0.20000	0.0	-0.24198	0.20000	0.09460	0.09790	0.0	4.24767	-0.01658	0.0	1.00000	0.100E+06	0.100E+06	
	0.4508	0.7123	0.9955	-0.0330	0.0	3.4653	0.4420	0.2000	0.2000	-0.5933				
19	0.20000	0.10000	-0.21837	0.20000	0.11676	0.10907	0.05454	4.23355	-0.00967	-0.00484	1.00000	0.162E+00	0.296E-05	
	0.4437	0.6997	0.9993	-0.0345	-0.0172	3.4438	0.4420	0.2236	0.2000	-0.5897				
20	0.20000	0.20000	-0.15514	0.20000	0.17099	0.12954	0.12885	4.19425	0.00145	-0.00408	1.00000	0.338E+00	0.542E-02	
	0.4227	0.6628	0.9985	-0.0377	-0.0352	3.3921	0.4420	0.2828	0.2000	-0.5797				
21	0.20000	0.30000	-0.08143	0.20000	0.23886	0.14644	0.21894	4.13809	-0.00332	-0.00447	1.00000	0.376E+00	0.262E-02	
	0.3861	0.6002	0.9568	-0.0441	-0.0671	3.3299	0.4420	0.3606	0.2000	-0.5644				
22	0.20000	0.40000	0.00523	0.20000	0.30970	0.15988	0.31681	4.07126	0.00421	-0.00380	1.00000	0.403E+00	0.586E-02	
	0.3421	0.5273	0.9940	-0.0477	-0.0981	3.2678	0.4420	0.4472	0.2000	-0.5489				
23	0.20000	0.50000	0.09654	0.20000	0.37842	0.16964	0.42016	3.99871	0.00381	-0.00292	1.00000	0.420E+00	0.496E-02	
	0.2888	0.4414	0.9869	-0.0516	-0.1317	3.2119	0.4420	0.5385	0.2000	-0.5337				
24	0.20000	0.60000	0.19047	0.20000	0.44295	0.17763	0.52702	3.92263	0.00441	-0.00136	1.00000	0.434E+00	0.486E-02	
	0.2280	0.3469	0.9844	-0.0547	-0.1669	3.1652	0.4420	0.6325	0.2000	-0.5204				
25	0.20000	0.70000	0.28603	0.20000	0.49904	0.18458	0.63721	3.84469	0.00495	-0.00071	1.00000	0.439E+00	0.519E-02	
	0.1597	0.2409	0.9773	-0.0574	-0.2038	3.1299	0.4420	0.7280	0.2000	-0.5098				
26	0.20000	0.80000	0.38264	0.20000	0.54807	0.19129	0.75245	3.76594	0.00585	-0.00223	1.00000	0.433E+00	0.640E-02	
	0.0845	0.1270	0.9684	-0.0597	-0.2422	3.1082	0.4420	0.8246	0.2000	-0.5027				
27	0.20000	0.90000	0.47997	0.20000	0.58862	0.19555	0.86723	3.68655	0.00346	-0.00374	1.00000	0.429E+00	0.428E-02	
	0.0055	0.0083	0.9577	-0.0620	-0.2809	3.1005	0.4420	0.9220	0.2000	-0.5000				
28	0.30000	0.0	-0.14198	0.30000	0.18629	0.20743	0.00938	4.18233	-0.00439	0.00279	1.00000	-0.346E+01	0.233E+00	
	0.4141	0.6480	0.9982	-0.0606	0.0007	3.3779	0.4420	0.3000	0.3000	-0.5759				
29	0.30000	0.10000	-0.12575	0.30000	0.20059	0.20619	0.08840	4.17098	-0.00654	-0.00437	1.00000	0.241E+00	0.622E-02	
	0.4054	0.6331	0.9979	-0.0632	-0.0216	3.3649	0.4420	0.3162	0.3000	-0.5722				
30	0.30000	0.20000	-0.08143	0.30000	0.23886	0.21941	0.14574	4.13809	-0.00187	-0.00421	1.00000	0.349E+00	0.434E-02	
	0.3861	0.6002	0.9968	-0.0665	-0.0450	3.3299	0.4420	0.3606	0.3000	-0.5644				
31	0.30000	0.30000	-0.01772	0.30000	0.29149	0.23426	0.23309	4.08932	0.00143	-0.00463	1.00000	0.378E+00	0.498E-02	
	0.3539	0.5467	0.9948	-0.0712	-0.0724	3.2835	0.4420	0.4243	0.3000	-0.5528				
32	0.30000	0.40000	0.05802	0.30000	0.35019	0.24772	0.32843	4.02951	0.00223	-0.00342	1.00000	0.409E+00	0.476E-02	
	0.3121	0.4786	0.9918	-0.0759	-0.1026	3.2343	0.4420	0.5000	0.3000	-0.5399				
33	0.30000	0.50000	0.14111	0.30000	0.40954	0.25944	0.42938	3.96288	0.00287	-0.00356	1.00000	0.416E+00	0.498E-02	
	0.2602	0.3963	0.9875	-0.0805	-0.1359	3.1884	0.4420	0.5831	0.3000	-0.5270				
34	0.30000	0.60000	0.22884	0.30000	0.46587	0.26969	0.53477	3.89188	0.00322	-0.00409	1.00000	0.418E+00	0.524E-02	
	0.1998	0.3023	0.9816	-0.0846	-0.1711	3.1500	0.4420	0.6708	0.3000	-0.5155				
35	0.30000	0.70000	0.31560	0.30000	0.51702	0.27949	0.64364	3.81779	0.00526	-0.00418	1.00000	0.422E+00	0.703E-02	
	0.1329	0.2001	0.9743	-0.0879	-0.2075	3.1213	0.4420	0.7616	0.3000	-0.5067				
36	0.30000	0.80000	0.41242	0.30000	0.56145	0.28619	0.75690	3.74141	0.00333	-0.00160	1.00000	0.436E+00	0.393E-02	
	0.0612	0.0919	0.9654	-0.0911	-0.2444	3.1040	0.4420	0.8544	0.3000	-0.5014				
37	0.30000	0.90000	0.50670	0.30000	0.59878	0.29381	0.87285	3.66484	0.00246	-0.00512	1.00000	0.425E+00	0.415E-02	
	0.0168	0.0252	0.9545	-0.0939	-0.2831	3.1011	0.4420	0.9487	0.3000	-0.5001				
38	0.40000	0.0	-0.04198	0.40000	0.27180	0.30482	0.00960	4.12802	-0.00266	0.00281	1.00000	-0.373E+01	0.388E+00	
	0.2668	0.5681	0.9957	-0.0932	-0.0007	3.3006	0.4420	0.4000	0.4000	-0.5573				
39	0.40000	0.10000	-0.02967	0.40000	0.28182	0.31066	0.07578	4.09841	0.00329	-0.00618	1.00000	0.195E+00	0.235E-01	

	0.3611	0.5585	0.9953	-0.0937	-0.0249	3.2917	0.4420	0.4123	0.4000	-0.5552			
40	0.40000	0.20000	0.00523	0.40000	0.30970	0.31802	0.15747	4.07126	0.00104	-0.00566	1.00000	0.329E+00	0.120E-01
	0.3421	0.5273	0.9540	-0.0970	-0.0499	3.2678	0.4420	0.4472	0.4000	-0.5489			
41	0.40000	0.30000	0.05802	0.40000	0.35020	0.32981	0.24587	4.02951	0.00132	-0.00405	1.00000	0.390E+00	0.670E-02
	0.3121	0.4786	0.9918	-0.1016	-0.0773	3.2343	0.4420	0.5000	0.4000	-0.5399			
42	0.40000	0.40000	0.12370	0.40000	0.39759	0.34226	0.34025	3.97660	0.00327	-0.00254	1.00000	0.419E+00	0.578E-02
	0.2726	0.4158	0.9886	-0.1060	-0.1072	3.1979	0.4420	0.5657	0.4000	-0.5298			
43	0.40000	0.50000	0.19833	0.40000	0.44706	0.35438	0.43988	3.91658	0.00257	-0.00433	1.00000	0.412E+00	0.600E-02
	0.2216	0.3359	0.9838	-0.1113	-0.1405	3.1621	0.4420	0.6403	0.4000	-0.5192			
44	0.40000	0.60000	0.27913	0.40000	0.49516	0.36580	0.54404	3.85082	0.00351	-0.00442	1.00000	0.417E+00	0.643E-02
	0.1634	0.2466	0.9777	-0.1157	-0.1751	3.1326	0.4420	0.7211	0.4000	-0.5103			
45	0.40000	0.70000	0.36424	0.40000	0.53940	0.37505	0.65306	3.78137	0.00147	-0.00332	1.00000	0.427E+00	0.336E-02
	0.0981	0.1475	0.9701	-0.1201	-0.2109	3.1117	0.4420	0.8062	0.4000	-0.5036			
46	0.40000	0.80000	0.45245	0.40000	0.57806	0.38545	0.76468	3.70887	0.00315	-0.00348	1.00000	0.428E+00	0.489E-02
	0.0283	0.0425	0.9610	-0.1233	-0.2477	3.1010	0.4420	0.8944	0.4000	-0.5003			
47	0.40000	0.90000	0.54290	0.40000	0.60588	0.39493	0.88002	3.63514	0.00245	-0.00638	1.00000	0.421E+00	0.531E-02
	0.0463	0.0694	0.9500	-0.1265	-0.2856	3.1034	0.4420	0.9849	0.4000	-0.5008			
48	0.50000	0.0	0.05802	0.50000	0.35020	0.41137	0.00139	4.02951	-0.00140	0.00472	1.00000	-0.405E+01	0.582E+00
	0.3121	0.4786	0.9918	-0.1276	0.0010	3.2343	0.4420	0.5000	0.5000	-0.5399			
49	0.50000	0.10000	0.06792	0.50000	0.35757	0.41411	0.10146	4.02145	0.00173	-0.00438	1.00000	0.275E+00	0.218E-01
	0.3068	0.4702	0.9914	-0.1281	-0.0264	3.2282	0.4420	0.5099	0.5000	-0.5385			
50	0.50000	0.20000	0.09654	0.50000	0.37842	0.42140	0.16628	3.99871	0.00122	-0.00654	1.00000	0.322E+00	0.171E-01
	0.2888	0.4414	0.9859	-0.1308	-0.0538	3.2119	0.4420	0.5385	0.5000	-0.5337			
51	0.50000	0.30000	0.14111	0.50000	0.40955	0.43095	0.25682	3.96287	0.00080	-0.00437	1.00000	0.389E+00	0.801E-02
	0.2642	0.3963	0.9875	-0.1349	-0.0819	3.1894	0.4420	0.5831	0.5000	-0.5270			
52	0.50000	0.40000	0.19833	0.50000	0.44706	0.44229	0.35136	3.91659	0.00155	-0.00477	1.00000	0.400E+00	0.745E-02
	0.2216	0.3359	0.9838	-0.1394	-0.1126	3.1621	0.4420	0.6403	0.5000	-0.5192			
53	0.50000	0.50000	0.26513	0.50000	0.48726	0.45430	0.45141	3.86242	0.00231	-0.00556	1.00000	0.402E+00	0.822E-02
	0.1733	0.2616	0.9788	-0.1441	-0.1455	3.1372	0.4420	0.7071	0.5000	-0.5116			
54	0.50000	0.60000	0.33604	0.50000	0.52699	0.46495	0.55500	3.80144	0.00284	-0.00211	1.00000	0.431E+00	0.459E-02
	0.1191	0.1792	0.9727	-0.1483	-0.1788	3.1163	0.4420	0.7810	0.5000	-0.5054			
55	0.50000	0.70000	0.41825	0.50000	0.56400	0.47631	0.66259	3.73714	0.00200	-0.00421	1.00000	0.423E+00	0.500E-02
	0.0554	0.0831	0.9646	-0.1528	-0.2148	3.1038	0.4420	0.8602	0.5000	-0.5012			
56	0.50000	0.80000	0.50142	0.50000	0.59631	0.48745	0.77390	3.66936	0.00334	-0.00352	1.00000	0.425E+00	0.553E-02
	0.0108	0.0162	0.9554	-0.1562	-0.2508	3.1001	0.4420	0.9434	0.5000	-0.5000			
57	0.60000	0.0	0.15802	0.60000	0.42091	0.52026	0.00221	3.94931	-0.00219	0.00588	1.00000	-0.456E+01	0.835E+00
	0.2487	0.3782	0.9864	-0.1643	0.0012	3.1803	0.4420	0.6000	0.6000	-0.5245			
58	0.60000	0.10000	0.16630	0.60000	0.42645	0.52216	0.08715	3.94261	-0.00205	-0.00029	1.00000	0.432E+00	-0.358E-03
	0.2433	0.3696	0.9859	-0.1650	-0.0219	3.1763	0.4420	0.6083	0.6000	-0.5234			
59	0.60000	0.20000	0.19047	0.60000	0.44206	0.52839	0.17352	3.92267	0.00204	-0.00578	1.00000	0.341E+00	0.190E-01
	0.2289	0.3460	0.9844	-0.1663	-0.0566	3.1652	0.4420	0.6325	0.6000	-0.5204			
60	0.60000	0.30000	0.22884	0.60000	0.46588	0.53694	0.26534	3.89188	0.00187	-0.00672	1.00000	0.366E+00	0.141E-01
	0.1998	0.3023	0.9816	-0.1702	-0.0864	3.1509	0.4420	0.6708	0.6000	-0.5155			
61	0.60000	0.40000	0.27513	0.60000	0.49515	0.54647	0.36216	3.85083	0.00363	-0.00407	1.00000	0.408E+00	0.669E-02
	0.1634	0.2465	0.9777	-0.1742	-0.1169	3.1326	0.4420	0.7211	0.6000	-0.5103			
62	0.60000	0.50000	0.33514	0.60000	0.52699	0.55747	0.46198	3.80144	0.00252	-0.00272	1.00000	0.424E+00	0.577E-02
	0.1191	0.1792	0.9727	-0.1781	-0.1491	3.1163	0.4420	0.7810	0.6000	-0.5054			
63	0.60000	0.60000	0.40655	0.60000	0.55899	0.56894	0.56570	3.74619	0.00261	-0.00284	1.00000	0.427E+00	0.545E-02

0.0660 0.0990 0.9660 -0.1824 -0.1831 3.1046 0.4420 0.8485 0.6000 -0.5016

64 0.60000 0.70000 0.47997 0.60000 0.58863 0.58170 0.67287 3.68655 0.00183-0.00538 1.00000 0.418E+00 0.643E-02
0.0055 0.0083 0.9577 -0.1868 -0.2188 3.1004 0.4420 0.9220 0.6000 -0.5000

65 0.60000 0.80000 0.55802 0.60000 0.61444 0.58974 0.78631 3.62175-0.00123-0.00165 1.00000 0.436E+00 0.121E-04
0.0567 0.0851 0.9483 -0.1904 -0.2539 3.1040 0.4420 1.0000 0.6000 -0.5012

66 0.70000 0.0 0.25802 0.70000 0.48317 0.63170 0.00198 3.86773-0.00024 0.00429 1.00000 -0.528E+01 0.117E+01
0.1799 0.2717 0.9755 -0.2013 0.0007 3.1391 0.4420 0.7000 0.7000 -0.5125

67 0.70000 0.10000 0.26513 0.70000 0.48725 0.63361 0.08928 3.86242-0.00185-0.00503 1.00000 0.276E+00 0.324E-01
0.1733 0.2616 0.9788 -0.2126 -0.0257 3.1372 0.4420 0.7071 0.7000 -0.5116

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0.1597 0.2409 0.9773 -0.2035 -0.0585 3.1299 0.4420 0.7280 0.7000 -0.5098

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0.1329 0.2201 0.9743 -0.2068 -0.0895 3.1213 0.4420 0.7616 0.7000 -0.5067

70 0.70000 0.40000 0.36424 0.70000 0.53940 0.65522 0.37162 3.78137 0.00020-0.00465 1.00000 0.404E+00 0.836E-02
0.0981 0.1475 0.9701 -0.2104 -0.1209 3.1117 0.4420 0.8062 0.7000 -0.5036

71 0.70000 0.50000 0.41825 0.70000 0.56491 0.66564 0.47204 3.73714 0.00083-0.00506 1.00000 0.410E+00 0.788E-02
0.0554 0.0831 0.9646 -0.2142 -0.1537 3.1038 0.4420 0.8602 0.7000 -0.5012

72 0.70000 0.60000 0.47997 0.70000 0.58863 0.67708 0.57609 3.68655 0.00100-0.00561 1.00000 0.413E+00 0.752E-02
0.0055 0.0083 0.9577 -0.2181 -0.1876 3.1004 0.4420 0.9220 0.7000 -0.5000

73 0.70000 0.70000 0.54797 0.70000 0.61145 0.68939 0.68337 3.62892 0.00535-0.00304 1.00000 0.429E+00 0.838E-02
0.0464 0.0696 0.9459 -0.2205 -0.2213 3.1018 0.4420 0.9899 0.7000 -0.5008

74 0.80000 0.0 0.35802 0.80000 0.53638 0.74590 0.00254 3.78667-0.00307 0.00460 1.00000 -0.630E+01 0.167E+01
0.1024 0.1539 0.9706 -0.2406 0.0007 3.1131 0.4420 0.8000 0.8000 -0.5040

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0.0981 0.1475 0.9701 -0.2408 -0.0308 3.1117 0.4420 0.8062 0.8000 -0.5036

76 0.80000 0.20000 0.38264 0.80000 0.54806 0.75235 0.18492 3.76595 0.00754-0.00526 1.00000 0.359E+00 0.213E-01
0.0845 0.1270 0.9684 -0.2418 -0.0612 3.1082 0.4420 0.8246 0.8000 -0.5027

77 0.80000 0.30000 0.41242 0.80000 0.56146 0.75875 0.28125 3.74141 0.00145-0.00491 1.00000 0.391E+00 0.145E-01
0.0612 0.0919 0.9654 -0.2449 -0.0922 3.1040 0.4420 0.8544 0.8000 -0.5014

78 0.80000 0.40000 0.45245 0.80000 0.57807 0.76766 0.37946 3.70887 0.00122-0.00627 1.00000 0.394E+00 0.137E-01
0.0283 0.0425 0.9610 -0.2472 -0.1244 3.1010 0.4420 0.8944 0.8000 -0.5003

79 0.80000 0.50000 0.50142 0.80000 0.59631 0.77754 0.48146 3.66836 0.00200-0.00549 1.00000 0.419E+00 0.107E-01
0.0108 0.0162 0.9554 -0.2502 -0.1571 3.1001 0.4420 0.9434 0.8000 -0.5000

80 0.80000 0.60000 0.55802 0.80000 0.61444 0.78632 0.58972 3.62175-0.00162-0.00124 1.00000 0.436E+00 0.345E-04
0.0567 0.0851 0.9483 -0.2538 -0.1904 3.1040 0.4420 1.0000 0.8000 -0.5012

81 0.50000 0.0 0.45802 0.90000 0.58239 0.86291 0.01379 3.70479-0.00198 0.00593 1.00000 -0.782E+01 0.249E+01
0.0243 0.0365 0.9604 -0.2786 0.0007 3.1005 0.4420 0.9000 0.9000 -0.5002

82 0.50000 0.10000 0.46356 0.90000 0.58247 0.86415 0.09608 3.69686 0.00142 0.00025 1.00000 0.450E+00-0.838E-03
0.0213 0.0320 0.9600 -0.2783 -0.0309 3.0996 0.4420 0.9055 0.9000 -0.5002

83 0.50000 0.20000 0.47997 0.90000 0.58863 0.86783 0.19289 3.68654-0.00291-0.00357 1.00000 0.433E+00-0.242E-03
0.0055 0.0083 0.9577 -0.2809 -0.0624 3.1004 0.4420 0.9220 0.9000 -0.5000

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0.0168 0.0252 0.9545 -0.2828 -0.0945 3.1011 0.4420 0.9487 0.9000 -0.5001

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0.0567 0.0851 0.9483 -0.3173 0.0 3.1043 0.4420 1.0000 1.0000 -0.5012

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     0.4055  C.6331  0.9978  0.0219 -0.0631  3.3649  0.4420  0.3162 -0.1000 -0.5722

 90-0.10000 C.40000-0.02967-0.10000 0.28181-0.07655 0.30847 4.09841 0.00271-0.00057 1.00000  0.436E+00 0.256E-02
     0.3611  C.5585  0.9953  0.0241 -0.0939  3.2917  0.4420  0.4123 -0.1000 -0.5552

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     0.3068  C.4702  0.9914  0.0265 -0.1281  3.2282  0.4420  0.5099 -0.1000 -0.5385

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     0.2433  C.3697  0.9859  0.0288 -0.1649  3.1763  0.4420  0.6083 -0.1000 -0.5234

 93-0.10000 C.70000 C.26513-0.10000 0.48726-0.08819 0.63362 3.86242 0.00522-0.00165 1.00000  0.433E+00 C.495E-02
     0.1733  C.2616  0.9788  0.0258 -0.2126  3.1372  0.4420  0.7071 -0.1000 -0.5116

 94-0.10000 C.80000 C.36424-0.10000 0.53941-0.09033 0.74766 3.78137 0.00580-0.00145 1.00000  0.436E+00 C.561E-02
     0.0981  C.1475  C.9701  0.0309 -0.2407  3.1117  0.4420  0.8062 -0.1000 -0.5036

 95-C.10000 C.90000 0.46356-0.10000 0.58267-0.09215 0.86458 3.69886 0.00586 0.00208 1.00000  0.445E+00 C.610E-02
     0.0214  0.0321  C.9600  0.0316 -0.2783  3.0996  0.4420  0.9055 -0.1000 -0.5002

 96-C.20000 0.0     -0.24198-0.20000 0.09460-0.09790 0.0     4.24767 0.01656 0.0      1.00000  0.100E+06 C.100E+06
     0.4508  C.7123  0.9555  0.0330  0.0       3.4653  0.4420  0.2000 -0.2000 -0.5933

 97-0.20000 C.10000-0.21837-0.20000 0.11676-0.10917 0.05454 4.23355 0.00967-0.00484 1.00000  0.162E+00-0.296E-05
     0.4437  C.6997  0.9993  0.0345 -0.0172  3.4438  0.4420  0.2236 -0.2000 -0.5897

 98-0.20000 C.20000-0.15914-0.20000 0.17099-0.12885 0.12954 4.19425 0.00408 0.00149 1.00000  0.481E+00 0.563E-02
     0.4227  C.6628  0.9985  0.0352 -0.0377  3.3921  0.4420  0.2828 -0.2000 -0.5797

 99-C.20000 C.30000-0.08143-0.20000 0.23886-0.14577 0.21939 4.13809 0.00409-0.00201 1.00000  0.412E+00 0.264E-02
     0.3861  C.6002  0.9968  0.0459 -0.0665  3.3299  0.4420  0.3606 -0.2000 -0.5644

100-0.20000 C.40000 0.00523-0.20000 0.30970-0.15752 0.31799 4.07126 0.00545 0.00053 1.00000  0.452E+00 C.593E-02
     0.3421  C.5273  0.9949  0.0458 -0.0979  3.2678  0.4420  0.4472 -0.2000 -0.5489

101-0.20000 C.50000 0.09654-0.20000 0.37842-0.16685 0.42117 3.99871 0.00471 0.00052 1.00000  0.446E+00 0.499E-02
     0.2888  0.4414  0.9869  0.0534 -0.1317  3.2119  0.4420  0.5385 -0.2000 -0.5337

102-0.20000 C.60000 C.19047-0.20000 0.44205-0.17410 0.52819 3.92263 0.00434 0.00156 1.00000  0.451E+00 0.487E-02
     0.2280  C.3460  0.9844  0.0564 -0.1664  3.1652  0.4420  0.6325 -0.2000 -0.5204

103-C.20000 C.70000 0.28603-0.20000 0.49904-0.17932 0.63854 3.84469 0.00461 0.00203 1.00000  0.452E+00 0.520E-02
     0.1597  C.2409  C.9773  0.0550 -0.2034  3.1299  0.4420  0.7280 -0.2000 -0.5098

104-C.20000 0.80000 0.38264-0.20000 0.54807-0.18437 0.75218 3.76554 0.00622 0.00079 1.00000  0.445E+00 0.642E-02
     0.0845  C.1270  C.9684  0.0613 -0.2417  3.1082  0.4420  0.8246 -0.2000 -0.5027

105-0.20000 C.90000 0.47997-0.20000 0.58862-0.19315 0.86843 3.68655 0.00471-0.00152 1.00000  0.435E+00 0.428E-02
     0.0055  C.0083  0.9577  0.0629 -0.2807  3.1035  0.4420  0.9220 -0.2000 -0.5000

106-0.30000 0.0     -0.14198-0.30000 0.18629-0.20043 0.00038 4.18233 0.00435 0.00275 1.00000 -0.346E+01-0.233E+00
     0.4141  C.6480  C.9982  0.0606  0.0007  3.3779  0.4420  0.3000 -0.3000 -0.5759

107-0.30000 C.10000-0.12575-0.30000 0.20059-0.21529 0.06899 4.17098 0.00785-0.00043 1.00000  0.421E+00 0.651E-02
     0.4054  C.6331  0.9978  0.0636 -0.1206  3.3649  0.4420  0.3162 -0.3000 -0.5722

108-C.30000 C.20000-0.08143-0.30000 0.23806-0.21891 0.14648 4.13809 0.00461-0.00011 1.00000  0.440E+00 0.444E-02
     0.3861  C.6002  0.9968  0.0671 -0.1441  3.3299  0.4420  0.3606 -0.3000 -0.5644

109-C.30000 C.30000-0.01772-0.30000 0.29149-0.23329 0.22426 4.08932 0.00463 0.00043 1.00000  0.448E+00 0.506E-02
     0.3539  C.5467  C.9948  0.0724 -0.1712  3.2835  0.4420  0.4243 -0.3000 -0.5528

110-0.30000 C.40000 0.05802-0.30000 0.35019-0.24593 0.32977 4.02951 0.00391 0.00115 1.00000  0.454E+00 C.481E-02
     0.3121  C.4786  C.9918  0.0772 -0.1016  3.2343  0.4420  0.5000 -0.3000 -0.5399

111-C.30000 C.50000 0.14111-0.30000 0.41954-0.25678 0.43098 3.96288 0.00445 0.00066 1.00000  0.448E+00 0.501E-02
```

	0.2602	C.3963	0.9875	0.0819	-0.1349	3.1884	0.4420	0.5831	-0.3000	-0.5270				
112-	-0.30000	0.60000	0.22884	-0.30000	0.46587	-0.26609	0.53661	3.85188	0.00521	0.00012	1.00000	0.443E+00	0.527E-02	
	0.1998	C.3023	0.9816	0.0861	-0.1703	3.1500	0.4420	0.5708	-0.3000	-0.5155				
113-	-0.30000	0.70000	0.31960	-0.30000	0.51702	-0.27333	0.64628	3.81779	0.00666	0.00092	1.00000	0.446E+00	0.706E-02	
	0.1329	C.2001	0.9743	0.0897	-0.2068	3.1213	0.4420	0.7616	-0.3000	-0.5067				
114-	-0.30000	0.80000	0.41242	-0.30000	0.56145	-0.28206	0.75045	3.74141	0.00356	0.00098	1.00000	0.446E+00	0.393E+02	
	0.0612	C.0919	0.9654	0.0920	-0.2440	3.1040	0.4420	0.8544	-0.3000	-0.5014				
115-	-0.30000	0.90000	0.50670	-0.30000	0.59808	-0.28867	0.87456	3.66484	0.00534	-0.00262	1.00000	0.433E+00	0.416E-02	
	0.0168	C.0252	0.9545	0.0947	-0.2829	3.1011	0.4420	0.9487	-0.3000	-0.5001				
116-	-0.40000	0.0	-0.04198	-0.40000	0.27180	-0.30482	0.00060	4.10802	0.00266	0.00281	1.00000	-0.373E+01	-0.388E+00	
	0.3668	C.5681	0.9957	0.0932	0.0307	3.3096	0.4420	0.4010	-0.4000	-0.5573				
117-	-0.40000	0.10000	-0.02967	-0.40000	0.28182	-0.30811	0.07838	4.09841	0.00264	0.00553	1.00000	0.691E+00	0.262E-01	
	0.3611	C.5585	0.9953	0.0944	-0.0221	3.2917	0.4420	0.4123	-0.4000	-0.5552				
118-	-0.40000	0.20000	0.00523	-0.40000	0.33970	-0.31679	0.15994	4.07126	0.00391	0.00424	1.00000	0.530E+00	0.126E-01	
	0.2421	C.5273	0.9940	0.0981	-0.0476	3.2678	0.4420	0.4472	-0.4000	-0.5486				
119-	-0.40000	0.30000	0.05802	-0.40000	0.35020	-0.32839	0.24778	4.02951	0.00355	0.00242	1.00000	0.474E+00	0.683E-02	
	0.2121	C.4786	0.9918	0.1026	-0.0759	3.2343	0.4420	0.5000	-0.4000	-0.5395				
120-	-0.40000	0.40000	0.12370	-0.40000	0.39759	-0.34025	0.34226	3.97660	0.00254	0.00327	1.00000	0.472E+00	0.585E-02	
	0.2726	C.4158	0.9886	0.1072	-0.1060	3.1970	0.4420	0.5657	-0.4000	-0.5258				
121-	-0.40000	0.50000	0.19833	-0.40000	0.44706	-0.35136	0.44229	3.91658	0.00475	0.00156	1.00000	0.453E+00	0.604E-02	
	0.2216	C.3359	0.9838	0.1126	-0.1394	3.1621	0.4420	0.6403	-0.4000	-0.5192				
122-	-0.40000	0.60000	0.27913	-0.40000	0.49516	-0.36150	0.54691	3.85082	0.00543	0.00154	1.00000	0.451E+00	0.647E-02	
	0.1634	C.2466	0.9777	0.1171	-0.1741	3.1326	0.4420	0.7211	-0.4000	-0.5103				
123-	-0.40000	0.70000	0.36424	-0.40000	0.53549	-0.37223	0.65468	3.78137	0.00361	-0.00042	1.00000	0.440E+00	0.337E-02	
	0.0581	C.1475	0.9701	0.1208	-0.2105	3.1117	0.4420	0.8062	-0.4000	-0.5036				
124-	-0.40000	0.80000	0.45245	-0.40000	0.57896	-0.38047	0.76716	3.70887	0.00468	0.00043	1.00000	0.444E+00	0.489E-02	
	0.0283	C.0425	0.9610	0.1242	-0.2472	3.1017	0.4420	0.8944	-0.4000	-0.5003				
125-	-0.40000	0.90000	0.54290	-0.40000	0.60588	-0.38856	0.88285	3.63514	0.00640	-0.00243	1.00000	0.434E+00	0.532E-02	
	0.0463	C.0694	0.9509	0.1273	-0.2853	3.1034	0.4420	0.9849	-0.4000	-0.5008				
126-	-0.50000	0.0	0.05802	-0.50000	0.35020	-0.41137	0.00138	4.02550	0.00140	0.00472	1.00000	-0.409E+01	-0.582E+00	
	0.3121	C.4786	0.9918	0.1276	0.0319	3.2343	0.4420	0.5000	-0.5000	-0.5399				
127-	-0.50000	0.10000	0.06792	-0.50000	0.35757	-0.41359	0.08406	4.02145	0.00100	0.00429	1.00000	0.614E+00	0.233E-01	
	0.3068	C.4702	0.9914	0.1284	-0.0247	3.2282	0.4420	0.5099	-0.5000	-0.5385				
128-	-0.50000	0.20000	0.09654	-0.50000	0.37842	-0.41983	0.17021	3.99871	0.00363	0.00557	1.00000	0.550E+00	0.180E-01	
	0.2888	C.4414	0.9869	0.1318	-0.0513	3.2119	0.4420	0.5385	-0.5000	-0.5337				
129-	-0.50000	0.30000	0.14111	-0.50000	0.43555	-0.42940	0.25540	3.96287	0.00348	0.00277	1.00000	0.476E+00	0.816E-02	
	0.2602	C.3963	0.9875	0.1358	-0.0805	3.1884	0.4420	0.5831	-0.5000	-0.5270				
130-	-0.50000	0.40000	0.19833	-0.50000	0.44706	-0.43988	0.35438	3.91659	0.00432	0.00256	1.00000	0.465E+00	0.755E-02	
	0.2216	C.3359	0.9838	0.1405	-0.1113	3.1621	0.4420	0.6403	-0.5000	-0.5192				
131-	-0.50000	0.50000	0.26513	-0.50000	0.49726	-0.45041	0.45430	3.86242	0.00596	0.00231	1.00000	0.458E+00	0.830E-02	
	0.1733	C.2616	0.9788	0.1455	-0.1441	3.1372	0.4423	0.7071	-0.5003	-0.5116				
132-	-0.50000	0.60000	0.33704	-0.50000	0.52699	-0.46236	0.55741	3.80144	0.00255	0.00241	1.00000	0.455E+00	0.461E-02	
	0.1191	C.1792	0.9727	0.1491	-0.1781	3.1163	0.4420	0.7810	-0.5000	-0.5054				
133-	-0.50000	0.70000	0.41825	-0.50000	0.56420	-0.47230	0.66546	3.73714	0.00463	0.00053	1.00000	0.444E+00	0.501E-02	
	0.0554	C.0831	0.9646	0.1537	-0.2142	3.1038	0.4420	0.8602	-0.5000	-0.5012				
134-	-0.50000	0.80000	0.50142	-0.50000	0.57631	-0.48204	0.77728	3.66836	0.00463	0.00147	1.00000	0.448E+00	0.555E-02	
	0.0168	C.0162	0.9554	0.1570	-0.2503	3.1021	0.4420	0.9434	-0.5000	-0.5000				
135-	-0.60000	0.0	0.15802	-0.60000	0.42001	-0.52326	0.00221	3.94531	0.00215	0.00568	1.00000	-0.459E+01	-0.835E+00	

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     0.2487  0.3782  0.9864  0.1643  0.0912  3.1803  0.4420  0.6000 -0.6000 -0.5245

136-0.60000 0.10000 0.16630-0.60000 0.42645-0.52216 0.08705 3.94261 0.00209-0.00029 1.00000  0.432E+00 0.358E-03
     0.2433  0.3696  0.9859  0.1650 -0.0275  3.1763  0.4420  0.6083 -0.6000 -0.5234

137-0.60000 0.20000 0.19047-0.60000 0.44206-0.52682 0.17821 3.92262 0.00183 0.00583 1.00000  0.547E+00 0.197E-01
     0.2280  0.3460  0.9844  0.1670 -0.0545  3.1652  0.4420  0.6325 -0.6000 -0.5204

138-0.60000 0.30000 0.22884-0.60000 0.46598-0.53444 0.27034 3.89188 0.00485 0.00472 1.00000  0.497E+00 0.144E-01
     0.1998  0.3023  0.9816  0.1712 -0.0843  3.1500  0.4420  0.6708 -0.6000 -0.5155

139-0.60000 0.40000 0.27913-0.60000 0.49515-0.54448 0.36515 3.85083 0.00351 0.00215 1.00000  0.460E+00 0.675E-02
     0.1634  0.2465  0.9777  0.1749 -0.1159  3.1326  0.4420  0.7211 -0.6000 -0.5103

140-0.60000 0.50000 0.33914-0.60000 0.52699-0.55494 0.46502 3.80144 0.00222 0.00297 1.00000  0.461E+00 0.581E-02
     0.1191  0.1792  0.9727  0.1788 -0.1483  3.1163  0.4420  0.7810 -0.6000 -0.5054

141-0.60000 0.60000 0.40655-0.60000 0.55650-0.56579 0.56894 3.74619 0.00284 0.00261 1.00000  0.456E+00 0.547E-02
     0.0660  0.0990  0.9660  0.1831 -0.1824  3.1046  0.4420  0.8485 -0.6000 -0.5016

142-0.60000 0.70000 0.47997-0.60000 0.58863-0.57619 0.67708 3.68655 0.00560 0.00099 1.00000  0.446E+00 0.646E-02
     0.0055  0.0083  0.9577  0.1876 -0.2181  3.1004  0.4420  0.9220 -0.6000 -0.5000

143-0.60000 0.80000 0.55802-0.60000 0.61444-0.58974 0.78631 3.62175 0.00123-0.00165 1.00000  0.436E+00-0.121E-04
     0.0567  0.0851  0.9483  0.1904 -0.2539  3.1040  0.4420  1.0000 -0.6000 -0.5012

144-0.70000 0.0     0.25802-0.70000 0.48311-0.63170 0.00198 3.86773 0.00024 0.00429 1.00000 -0.528E+01-0.117E+01
     0.1799  0.2717  0.9795  0.2013  0.0007  3.1391  0.4420  0.7000 -0.7000 -0.5125

145-0.70000 0.10000 0.26513-0.70000 0.48125-0.63298 0.09266 3.86242 0.00322 0.00429 1.00000  0.591E+00 0.341E-01
     0.1733  0.2616  0.9788  0.2028 -0.0282  3.1372  0.4420  0.7071 -0.7000 -0.5116

146-0.70000 0.20000 0.28603-0.70000 0.49503-0.63758 0.18328 3.84469-0.00006 0.00232 1.00000  0.481E+00 0.809E-02
     0.1597  0.2409  0.9773  0.2037 -0.0578  3.1299  0.4420  0.7280 -0.7000 -0.5098

147-0.70000 0.30000 0.31960-0.70000 0.51301-0.64391 0.27886 3.81780 0.00366 0.00404 1.00000  0.487E+00 0.132E-01
     0.1329  0.2001  0.9743  0.2075 -0.0880  3.1213  0.4420  0.7616 -0.7000 -0.5067

148-0.70000 0.40000 0.36424-0.70000 0.53540-0.65272 0.37566 3.78137 0.00394 0.00256 1.00000  0.463E+00 0.844E-02
     0.0981  0.1475  0.9701  0.2110 -0.1159  3.1117  0.4420  0.8062 -0.7000 -0.5036

149-0.70000 0.50000 0.41825-0.70000 0.56401-0.66241 0.47656 3.73714 0.00452 0.00242 1.00000  0.457E+00 0.792E-02
     0.0554  0.0831  0.9646  0.2149 -0.1528  3.1038  0.4420  0.8602 -0.7000 -0.5012

150-0.70000 0.60000 0.47597-0.70000 0.58863-0.67287 0.59101 3.68655 0.00535 0.00185 1.00000  0.451E+00 0.755E-02
     0.0055  0.0083  0.9577  0.2189 -0.1868  3.1004  0.4420  0.9220 -0.7000 -0.5000

151-0.70000 0.70000 0.54797-0.70000 0.61145-0.68337 0.68939 3.62892 0.00304 0.00535 1.00000  0.465E+00 0.840E-02
     0.0464  0.0696  0.9499  0.2213 -0.2205  3.1018  0.4420  0.9899 -0.7000 -0.5008

152-0.80000 0.0     0.35802-0.80000 0.53638-0.74590 0.00254 3.78667 0.00307 0.00460 1.00000 -0.630E+01-0.167E+01
     0.1024  0.1539  0.9706  0.2406  0.0007  3.1131  0.4420  0.8000 -0.8000 -0.5040

153-0.80000 0.10000 0.36424-0.80000 0.53541-0.74694 0.09613 3.78137 0.00275 0.00462 1.00000  0.594E+00 0.406E-01
     0.0981  0.1475  0.9701  0.2409 -0.0294  3.1117  0.4420  0.8062 -0.8000 -0.5036

154-0.80000 0.20000 0.38264-0.80000 0.54806-0.75059 0.19073 3.76595 0.00195 0.00489 1.00000  0.521E+00 0.219E-01
     0.0845  0.1270  0.9684  0.2421 -0.0558  3.1082  0.4420  0.8246 -0.8000 -0.5027

155-0.80000 0.30000 0.41242-0.80000 0.56146-0.75659 0.28709 3.74141 0.00211 0.00468 1.00000  0.492E+00 0.147E-01
     0.0612  0.0919  0.9654  0.2444 -0.0911  3.1040  0.4420  0.8544 -0.8000 -0.5014

156-0.80000 0.40000 0.45245-0.80000 0.57877-0.76417 0.39645 3.70887 0.00328 0.00474 1.00000  0.479E+00 0.138E-01
     0.0283  0.0425  0.9610  0.2478 -0.1231  3.1010  0.4420  0.8944 -0.8000 -0.5003

157-0.80000 0.50000 0.50142-0.80000 0.59631-0.77354 0.48803 3.66836 0.00406-0.00420 1.00000  0.468E+00 0.108E-01
     0.0108  0.0162  0.9554  0.2508 -0.1561  3.1001  0.4420  0.9434 -0.8000 -0.5000

158-0.80000 0.60000 0.55802-0.80000 0.61444-0.78632 0.58572 3.62175-0.00162-0.00124 1.00000  0.436E+00-0.345E-04
     0.0567  0.0851  0.9483  0.2538 -0.1904  3.1043  0.4420  1.0000 -0.8000 -0.5012

159-0.90000 0.0     0.45802-0.90000 0.59029-0.86291 0.00379 3.70498 0.00398 0.00593 1.00000 -0.782E+01-0.240E+01
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     0.0243  0.0369  0.9604  0.2786  0.0007  3.1005  0.4420  0.9000 -0.9000 -0.5002

160-0.60000 0.10000 0.46356-0.90000 0.58247-0.86415 0.09608 3.69886-0.00142 0.00025 1.00000  0.450E+00 0.838E-03
     0.0213  0.0320  0.9600  0.2783 -0.0309  3.0996  0.4420  0.9055 -0.9000 -0.5002

161-0.60000 0.20000 0.47997-0.90000 0.58863-0.86783 0.19289 3.68654 0.00281-0.00057 1.00000  0.433E+00 0.242E-03
     0.0055  0.0082  0.9577  0.2808 -0.0624  3.1004  0.4420  0.9220 -0.9000 -0.5000

162-0.60000 0.30000 0.50670-0.90000 0.59879-0.87240 0.29512 3.66483 0.00576 0.00439 1.00000  0.487E+00 0.190E-01
     0.0168  0.0252  0.9545  0.2832 -0.0939  3.1011  0.4420  0.9487 -0.9000 -0.5001

163-0.60000 0.40000 0.54290-0.90000 0.60585-0.87973 0.39559 3.63513 0.00678 0.00341 1.00000  0.468E+00 0.145E-01
     0.0463  0.0694  0.9503  0.2857 -0.1264  3.1034  0.4420  0.9849 -0.9000 -0.5008

164-1.00000 0.0     0.55892-1.00000 0.61444-0.98289 0.0     3.62176 0.00238 0.0     1.00000  0.100E+06 0.100E+06
     0.0167  0.0851  0.9483  0.3173  0.0     3.1040  0.4420  1.0000 -1.0000 -0.5012

1MIRROR.IMAGE EKEW RAYS.FOLLOW
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IMAGE RAY	RAY	RAYY	RAYZ	OPL	YIN	ZIN	NTNCTY	XDIAPT YDIAPT
165	1	0.0	-0.2000000	4.24781704	0.0	0.0198995	1.0000000	-0.143E+00 0.0
166	2	0.0	-0.3000001	4.18230820	0.0	0.0035946	1.0000000	0.376E+00 0.0
167	3	0.0	-0.4000001	4.10801315	0.0057445	0.0026656	1.0000000	0.413E+00 0.571E-02
168	4	0.0	-0.5000001	4.02949905	0.0031240	0.0014027	1.0000000	0.431E+00 0.312E-02
169	5	0.0	-0.6000001	3.94930363	0.0036701	0.0022022	1.0000000	0.429E+00 0.366E-02
170	6	0.0	-0.7000002	3.86772346	0.0048978	0.0002471	1.0000000	0.441E+00 0.450E-02
171	7	0.0	-0.8000002	3.78667068	0.0051622	0.0030653	1.0000000	0.430E+00 0.515E-02
172	8	0.0	-0.9000002	3.70408630	0.0064321	0.0009802	1.0000000	0.439E+00 0.643E-02
173	9	0.1000000	-0.1000000	4.27620602	-0.0134138	0.0134328	1.0000000	-0.718E+00 0.129E-04
174	10	0.1000000	-0.2000000	4.23377800	-0.0074725	0.0145505	1.0000000	0.271E-01 0.238E-05
175	11	0.1000000	-0.3000001	4.17058236	0.0005957	0.0081937	1.0000000	0.314E+00 0.322E-02
176	12	0.1000000	-0.4000001	4.09840775	0.0021195	0.0017822	1.0000000	0.423E+00 0.255E-02
177	13	0.1000000	-0.5000001	4.02144909	0.0042449	0.0009454	1.0000000	0.435E+00 0.423E-02
178	14	0.1000000	-0.6000001	3.94261169	0.0065244	0.0032411	1.0000000	0.423E+00 0.704E-02
179	15	0.1000000	-0.7000002	3.86242008	0.0044937	0.0032411	1.0000000	0.426E+00 0.494E-02
180	16	0.1000000	-0.8000002	3.78136730	0.0052644	0.0028350	1.0000000	0.431E+00 0.561E-02

181	17	0.1000000-0.9000002	3.69885731	0.0061719	-0.0007428	1.0000000	0.445E+00 0.609E-02
182	19	0.2000000-0.1000000	4.23354816	-0.0096710	0.0048371	1.0000000	0.162E+00 0.296E-05
183	20	0.2000000-0.2000000	4.19424915	0.0014912	0.0040836	1.0000000	0.338E+00 0.542E-02
184	21	0.2000000-0.3000001	4.13809490	-0.0003188	0.0044667	1.0000000	0.376E+00 0.262E-02
185	22	0.2000000-0.4000001	4.07125664	0.0040126	0.0037993	1.0000000	0.403E+00 0.586E-02
186	23	0.2000000-0.5000001	3.99870968	0.0038123	0.0029189	1.0000000	0.420E+00 0.496E-02
187	24	0.2000000-0.6000001	3.92262745	0.0044113	0.0013566	1.0000000	0.434E+00 0.486E-02
188	25	0.2000000-0.7000002	3.84469032	0.0049873	0.0007067	1.0000000	0.439E+00 0.519E-02
189	26	0.2000000-0.8000002	3.76593876	0.0058548	0.0022324	1.0000000	0.433E+00 0.640E-02
190	27	0.2000000-0.9000002	3.68655014	0.0034583	0.0037356	1.0000000	0.425E+00 0.428E-02
191	29	0.3000001-0.1000000	4.17098427	-0.0065413	0.0043663	1.0000000	0.241E+00 0.622E-02
192	30	0.3000001-0.2000000	4.13809395	-0.0018694	0.0042081	1.0000000	0.349E+00 0.434E-02
193	31	0.3000001-0.3000001	4.08931923	0.0004252	0.0046253	1.0000000	0.378E+00 0.498E-02
194	32	0.3000001-0.4000001	4.02950668	0.0022334	0.0034167	1.0000000	0.409E+00 0.476E-02
195	33	0.3000001-0.5000001	3.96287727	0.0028701	0.0035567	1.0000000	0.416E+00 0.498E-02
196	34	0.3000001-0.6000001	3.89187622	0.0032192	0.0040933	1.0000000	0.418E+00 0.524E-02
197	35	0.3000001-0.7000002	3.81779099	0.0052586	0.0041849	1.0000000	0.422E+00 0.703E-02
198	36	0.3000001-0.8000002	3.74141121	0.0033311	0.0016008	1.0000000	0.436E+00 0.393E-02
199	37	0.3000001-0.9000002	3.66403879	0.0024558	0.0051180	1.0000000	0.425E+00 0.415E-02
200	39	0.4000001-0.1000000	4.09841961	0.0002853	0.0041785	1.0000000	0.195E+00 0.235E-01
201	40	0.4000001-0.2000000	4.07125568	0.0010406	0.0056564	1.0000000	0.329E+00 0.120E-01
202	41	0.4000001-0.3000001	4.02950764	0.0013393	0.0040893	1.0000000	0.350E+00 0.670E-02
203	42	0.4000001-0.4000001	3.97659969	0.0032655	0.0025432	1.0000000	0.419E+00 0.578E-02
204	43	0.4000001-0.5000001	3.91658401	0.0025682	0.0043292	1.0000000	0.412E+00 0.600E-02

206	45	0.4000001-0.7000002	3.78136921	0.0014706	0.0033197	1.0000000	0.427E+00 0.336E-02
207	46	0.4000001-0.8000002	3.70887089	0.0031533	0.0034804	1.0000000	0.428E+00 0.489E-02
208	47	0.4000001-0.9000002	3.63513851	0.0024878	0.0063819	1.0000000	0.421E+00 0.531E-02
209	48	0.5000001-0.1000000	4.02145481	0.0007316	0.0043819	1.0000000	0.279E+00 0.218E-01
210	50	0.5000001-0.2000000	3.95870968	0.0012194	0.0065384	1.0000000	0.322E+00 0.171E-01
211	51	0.5000001-0.3000001	3.96287441	0.0008025	0.0043737	1.0000000	0.389E+00 0.801E-02
212	52	0.5000001-0.4000001	3.91658592	0.0015495	0.0047715	1.0000000	0.400E+00 0.745E-02
213	53	0.5000001-0.5000001	3.86241627	0.0023125	0.0059635	1.0000000	0.402E+00 0.822E-02
214	54	0.5000001-0.6000001	3.80144215	0.0028403	0.0021100	1.0000000	0.431E+00 0.459E-02
215	55	0.5000001-0.7000002	3.73713970	0.0020005	0.0042123	1.0000000	0.423E+00 0.500E-02
216	56	0.5000001-0.8000002	3.66836357	0.0033442	0.0035158	1.0000000	0.425E+00 0.553E-02
217	58	0.6000001-0.1000000	3.94261456	-0.0020880	0.0002881	1.0000000	0.432E+00 -0.358E-03
218	59	0.6000001-0.2000000	3.92262459	0.0020403	0.0057829	1.0000000	0.341E+00 0.190E-01
219	60	0.6000001-0.3000001	3.89187527	0.0008706	0.0067160	1.0000000	0.366E+00 0.141E-01
220	61	0.6000001-0.4000001	3.85083008	0.0006314	0.0040655	1.0000000	0.408E+00 0.669E-02
221	62	0.6000001-0.5000001	3.80144215	0.0025223	0.0027704	1.0000000	0.424E+00 0.577E-02
222	63	0.6000001-0.6000001	3.74619007	0.0026141	0.0028427	1.0000000	0.427E+00 0.545E-02
223	64	0.6000001-0.7000002	3.68654537	0.0018344	0.0053829	1.0000000	0.418E+00 0.643E-02
224	65	0.6000001-0.8000002	3.62175465	-0.0012268	0.0016519	1.0000000	0.436E+00 0.121E-04
225	67	0.7000002-0.1000000	3.86242008	-0.0018887	0.0050298	1.0000000	0.276E+00 0.324E-01
226	68	0.7000002-0.2000000	3.84469223	0.0012742	0.0019271	1.0000000	0.410E+00 0.758E-02
227	69	0.7000002-0.3000001	3.81779575	0.0004907	0.0054382	1.0000000	0.383E+00 0.130E-01
228	70	0.7000002-0.4000001	3.78136826	0.0001986	0.0046919	1.0000000	0.404E+00 0.836E-02

229	71	0.70C0002-0.9C00001	3.73713875	0.0098278	0.0050603	1.0000000	0.410E+00 0.788E-02
230	72	0.70C0002-0.8000001	3.68654537	0.0009997	0.0056100	1.0000000	0.413E+00 0.752E-02
231	73	0.70C0002-0.7000002	3.62852056	0.0053498	0.0030365	1.0000000	0.429E+00 0.838E-02
232	75	0.8CC0002-0.1000000	3.78136921	-0.0015299	0.0051508	1.0000000	0.280E+00 0.387E-01
233	76	0.80C0002-0.2000000	3.76594925	0.0005434	0.0052606	1.0000000	0.359E+00 0.213E-01
234	77	0.8000002-0.3000001	3.74140835	0.0014886	0.0049132	1.0000000	0.391E+00 0.145E-01
235	78	0.8000002-0.4000001	3.70866612	0.0012226	0.0062661	1.0000000	0.394E+00 0.137E-01
236	79	0.80C0002-0.5000001	3.66835785	0.0019963	0.0054873	1.0000000	0.409E+00 0.107E-01
237	80	0.8CC0C02-0.6000001	3.62175083	-0.0016157	0.0012376	1.0000000	0.436E+00 0.345E-04
238	82	0.9CC0C02-0.1000000	3.69885540	0.0014205	-0.0002509	1.0000000	0.450E+00 -0.838E-03
239	83	0.90C0002-0.2000000	3.68654060	-0.0028115	0.0005708	1.0000000	0.433E+00 -0.242E-03
240	84	0.9CC0002-0.3000001	3.66483402	-0.0019777	0.0069733	1.0000000	0.372E+00 0.188E-01
241	85	0.9CC0002-0.4000001	3.63512611	-0.0020176	0.0073020	1.0000000	0.388E+00 0.143E-01
242	87	-0.10C0000-0.1000000	4.27620602	0.0134138	0.0134328	1.0000000	-0.718E+00 -0.129E-04
243	88	-0.10C0000-0.2000000	4.23377800	0.0074725	0.0149505	1.0000000	0.271E-01 -0.238E-05
244	89	-0.10C0000-0.3000001	4.17098236	0.0053931	0.0061972	1.0000000	0.344E+00 0.324E-02
245	90	-0.10C0000-0.4000001	4.09840775	0.0027089	0.0005748	1.0000000	0.436E+00 0.256E-02
246	91	-0.10C0000-0.5000001	4.02144909	0.0040982	-0.0006833	1.0000000	0.447E+00 0.424E-02
247	92	-0.10C0000-0.6000001	3.94261169	0.0072236	0.0009497	1.0000000	0.436E+00 0.706E-02
248	93	-0.10C0000-0.7000002	3.86242008	0.0052215	0.0018533	1.0000000	0.433E+00 0.495E-02
249	94	-0.10C0000-0.8000002	3.78136739	0.0058206	0.0014518	1.0000000	0.436E+00 0.561E-02
250	95	-0.10C0000-0.9000002	3.69886208	0.0059587	-0.0020813	1.0000000	0.449E+00 0.610E-02
251	97	-0.20C0000-0.1000000	4.23354916	0.0096713	0.0048371	1.0000000	0.162E+00 -0.296E-05
252	98	-0.20C0000-0.2000000	4.19424915	0.0040841	-0.0014917	1.0000000	0.481E+00 0.563E-02

253	99-0.2000000-0.3000001	4.13809490	0.0040009	0.0020119	1.0000000	0.412E+00 0.264E-02
254	100-0.2000000-0.4000001	4.07125664	0.0054467	-0.0009313	1.0000000	0.452E+00 0.593E-02
255	101-0.2000000-0.5000001	3.99870968	0.0047748	-0.0005158	1.0000000	0.446E+00 0.459E-02
256	102-0.2000000-0.6000001	3.92262745	0.0043437	-0.0015618	1.0000000	0.451E+00 0.487E-02
257	103-0.2000000-0.7000002	3.84469032	0.0046076	-0.0020347	1.0000000	0.452E+00 0.520E-02
258	104-0.2000000-0.8000002	3.76553876	0.0062163	-0.0007867	1.0000000	0.445E+00 0.642E-02
259	105-0.2000000-0.9000002	3.68655109	0.0047147	0.0019197	1.0000000	0.435E+00 0.428E-02
260	107-0.3000001-0.1000000	4.17058427	0.0078518	0.0004347	1.0000000	0.421E+00 0.651E-02
261	108-0.3000001-0.2000000	4.13809395	0.0046051	0.0001057	1.0000000	0.440E+00 0.444E-02
262	109-0.3000001-0.3000001	4.08921923	0.0046293	-0.0004252	1.0000000	0.448E+00 0.506E-02
263	110-0.3000001-0.4000001	4.02950668	0.0039058	-0.0011879	1.0000000	0.454E+00 0.481E-02
264	111-0.3000001-0.5000001	3.96287632	0.0044900	-0.0008590	1.0000000	0.448E+00 0.501E-02
265	112-0.3000001-0.6000001	3.89187622	0.0052064	-0.0001195	1.0000000	0.443E+00 0.527E-02
266	113-0.3000001-0.7000002	3.81779099	0.0066570	-0.0009219	1.0000000	0.446E+00 0.706E-02
267	114-0.3000001-0.8000002	3.74141121	0.0035624	-0.0005843	1.0000000	0.446E+00 0.393E-02
268	115-0.3000001-0.9000002	3.66483784	0.0059353	0.0026217	1.0000000	0.433E+00 0.416E-02
269	117-0.4000001-0.1000000	4.09841347	0.0026416	-0.0055342	1.0000000	0.691E+00 0.262E-01
270	118-0.4000001-0.2000000	4.07125568	0.0039065	-0.0042384	1.0000000	0.530E+00 0.126E-01
271	119-0.4000001-0.3000001	4.02950764	0.0035535	-0.0024226	1.0000000	0.474E+00 0.683E-02
272	120-0.4000001-0.4000001	3.97659874	0.0025439	-0.0032657	1.0000000	0.472E+00 0.585E-02
273	121-0.4000001-0.5000001	3.91658401	0.0047873	-0.0015551	1.0000000	0.453E+00 0.604E-02
274	122-0.4000001-0.6000001	3.85082245	0.0054280	-0.0015447	1.0000000	0.451E+00 0.647E-02
275	123-0.4000001-0.7000002	3.78137016	0.0036079	0.0014176	1.0000000	0.440E+00 0.337E-02
276	124-0.4000001-0.8000002	3.70887089	0.0046762	-0.0004343	1.0000000	0.444E+00 0.489E-02

277	125-0.40C0001-0.5000002	3.63513851	0.0064029	0.0024297	1.0000000	0.434E+00 0.532E-02
278	127-0.50C0001-0.1000000	4.02145481	0.0010009	-0.0042852	1.0000000	0.614E+00 0.233E-01
279	128-0.50C0C01-0.2000000	3.95870968	0.0036254	-0.0055743	1.0000000	0.550E+00 0.180E-01
280	129-0.50C0001-0.3000001	3.96287441	0.0034848	-0.0027714	1.0000000	0.476E+00 0.816E-02
281	130-0.50C0001-0.4000001	3.91658592	0.0043177	-0.0025625	1.0000000	0.465E+00 0.755E-02
282	131-0.50C0001-0.5000001	3.86241627	0.0059636	-0.0023128	1.0000000	0.458E+00 0.830E-02
283	132-0.50C0001-0.6000001	3.80144215	0.0025878	-0.0024131	1.0000000	0.455E+00 0.461E-02
284	133-0.5CC0001-0.7000002	3.73713970	0.0046332	-0.0005262	1.0000000	0.444E+00 0.511E-02
285	134-0.50C0001-0.8000002	3.66836357	0.0046262	-0.0014655	1.0000000	0.448E+00 0.555E-02
286	136-0.60C0001-0.1000000	3.94261456	0.0020880	0.0002881	1.0000000	0.432E+00 0.358E-03
287	137-0.60C0001-0.2000000	3.92262459	0.0018329	-0.0058342	1.0000000	0.547E+00 0.197E-01
288	138-0.60C0001-0.3000001	3.89187527	0.0048479	-0.0047212	1.0000000	0.497E+00 0.144E-01
289	139-0.60C0001-0.4000001	3.85082912	0.0035105	-0.0021466	1.0000000	0.460E+00 0.675E-02
290	140-0.60C0001-0.5000001	3.80144215	0.0022221	-0.0025728	1.0000000	0.461E+00 0.581E-02
291	141-0.60C0001-0.6000001	3.74619007	0.0028422	-0.0026136	1.0000000	0.456E+00 0.547E-02
292	142-0.60C0C01-0.7000002	3.68654537	0.0056022	-0.0005915	1.0000000	0.446E+00 0.646E-02
293	143-0.60C0001-0.8000002	3.62175465	0.0012268	0.0016519	1.0000000	0.436E+00 -0.121E-04
294	145-0.70C0002-0.1000000	3.86242078	0.0032207	-0.0042936	1.0000000	0.591E+00 0.341E-01
295	146-0.70C0002-0.2000000	3.84469414	-0.0000638	-0.0023152	1.0000000	0.481E+00 0.869E-02
296	147-0.70C0002-0.3000001	3.81779575	0.0036606	-0.0040385	1.0000000	0.487E+00 0.132E-01
297	148-0.70C0002-0.4000001	3.78137112	0.0039424	-0.0025558	1.0000000	0.463E+00 0.844E-02
298	149-0.70C0002-0.5000001	3.73713875	0.0045169	-0.0024221	1.0000000	0.457E+00 0.752E-02
299	150-0.70C0002-0.6000001	3.68654537	0.0053916	-0.0018466	1.0000000	0.451E+00 0.755E-02
300	151-0.70C0002-0.7000002	3.62852151	0.0039340	-0.0053493	1.0000000	0.465E+00 0.440E-02

301	153-0.8000002-0.1000000	3.78136921	0.0027502	-0.0046188	1.0000000	0.594E+00 0.406E-01
302	154-0.8000002-0.2000000	3.76594830	0.0019947	-0.0048919	1.0000000	0.521E+00 0.218E-01
303	155-0.8000002-0.3000001	3.74140835	0.0021075	-0.0046767	1.0000000	0.492E+00 0.147E-01
304	156-0.8000002-0.4000001	3.70886612	0.0042796	-0.0047378	1.0000000	0.479E+00 0.138E-01
305	157-0.8000002-0.5000001	3.66835785	0.0040574	-0.0041987	1.0000000	0.468E+00 0.108E-01
306	158-0.8000002-0.6000001	3.62175083	0.0016157	0.0012376	1.0000000	0.436E+00 -0.345E-04
307	160-0.9000002-0.1000000	3.69885540	-0.0014205	-0.0002509	1.0000000	0.450E+00 0.838E-03
308	161-0.9000002-0.2000000	3.68654060	0.0028115	0.0005708	1.0000000	0.433E+00 0.242E-03
309	162-0.9000002-0.3000001	3.66483307	0.0057648	-0.0043888	1.0000000	0.487E+00 0.190E-01
310	163-0.9000002-0.4000001	3.63512611	0.0067769	-0.0034063	1.0000000	0.468E+00 0.145E-01

END OF SKEW RAY TRACE.

TOTAL NUMBER OF RAYS TRACED = 310
TOTAL NUMBER OF PROPER IMAGE RAYS = 146
TOTAL NUMBER OF RAYS STRIKING IMAGE PLANE = 310

1 IMAGE PLANE SPOT DIAGRAM ANALYSIS:

THICKNESS =0.0500000 U =0.0 ALFAP =0.0 R =1.0000000

CENTROID: ZCENTR = 0.0, YCENTR = 0.0026398

STANDARD DEVIATIONS: SIGMAY = 0.0000121 SIGMAZ = 0.0000207

RMS SPOT SIZE: RMSRAD = 0.0057336

SPOT DIAGRAM ENERGY DENSITY VS. RADIUS FROM CENTROID:

IZ4	RADIUS	FRACTION
1	0.0050000	0.6741935
2	0.0100000	0.9483871
3	0.0150000	0.9645161
4	0.0200000	0.9870967
5	0.0250000	1.0000000
6	0.0300000	1.0000000
7	0.0350000	1.0000000
8	0.0400000	1.0000000
9	0.0450000	1.0000000
10	0.0500000	1.0000000
11	0.0550000	1.0000000
12	0.0600000	1.0000000
13	0.0649999	1.0000000
14	0.0699999	1.0000000
15	0.0749999	1.0000000
16	0.0799999	1.0000000
17	0.0849999	1.0000000
18	0.0899999	1.0000000
19	0.0949999	1.0000000

20	0.0999995	1.0000000
21	0.1049995	1.0000000
22	0.1099995	1.0000000
23	0.1149995	1.0000000
24	0.1199995	1.0000000
25	0.1249995	1.0000000
26	0.1299995	1.0000000
27	0.1349995	1.0000000
28	0.1399995	1.0000000
29	0.1449995	1.0000000
30	0.1499995	1.0000000
31	0.1549995	1.0000000
32	0.1599995	1.0000000
33	0.1649995	1.0000000
34	0.1699995	1.0000000
35	0.1749995	1.0000000
36	0.1799995	1.0000000
37	0.1849995	1.0000000
38	0.1899995	1.0000000
39	0.1949995	1.0000000
40	0.1999995	1.0000000
41	0.2049995	1.0000000
42	0.2099995	1.0000000
43	0.2149995	1.0000000
44	0.2199995	1.0000000
45	0.2249995	1.0000000
46	0.2299995	1.0000000
47	0.2349995	1.0000000
48	0.2399995	1.0000000
49	0.2449995	1.0000000
50	0.2499995	1.0000000
51	0.2549995	1.0000000
52	0.2599995	1.0000000
53	0.2649995	1.0000000
54	0.2699995	1.0000000
55	0.2749995	1.0000000
56	0.2799995	1.0000000
57	0.2849995	1.0000000
58	0.2899995	1.0000000
59	0.2949995	1.0000000
60	0.2999995	1.0000000
61	0.3049995	1.0000000
62	0.3099995	1.0000000
63	0.3149995	1.0000000
64	0.3199995	1.0000000
65	0.3249995	1.0000000
66	0.3299995	1.0000000
67	0.3349995	1.0000000
68	0.3399995	1.0000000
69	0.3449995	1.0000000
70	0.3499995	1.0000000
71	0.3549995	1.0000000
72	0.3599995	1.0000000
73	0.3649995	1.0000000
74	0.3699995	1.0000000
75	0.3749995	1.0000000
76	0.3799995	1.0000000
77	0.3849995	1.0000000
78	0.3899995	1.0000000
79	0.3949995	1.0000000
80	0.3999995	1.0000000
81	0.4049995	1.0000000
82	0.4099995	1.0000000
83	0.4149995	1.0000000
84	0.4199995	1.0000000
85	0.4249995	1.0000000
86	0.4299995	1.0000000
87	0.4349995	1.0000000
88	0.4399995	1.0000000
89	0.4449995	1.0000000
90	0.4499995	1.0000000
91	0.4549995	1.0000000

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 S2   0.4599996   1.0000000
 S3   0.4649996   1.0000000
 S4   0.4699996   1.0000000
 S5   0.4749996   1.0000000
 S6   0.4799996   1.0000000
 S7   0.4849996   1.0000000
 S8   0.4899996   1.0000000
 S9   0.4949996   1.0000000
100   0.4599996   1.0000000
SPOT DIAGRAM CALCULATIONS COMPLETE.
TO OBTAIN PLOTS FROM THE PLOTTER OR THE PRINTER,
ISSUE THE FOLLOWING COMMAND:
        FOR PRINTER PLOTS          ENTER "LENSCOM PRINTER"
        FOR PLOTTER GRAPHS         ENTER "LENSCOM PLOTTER"
END OF PROGRAM
```

* GRIN PARAMETERS(2):

ALPHA = 0.7853979 BETA = 0.3222679 RADIUS = 1.00000 INCIDENT ANGLE = 0.0 ITERATIONS = 1008

EDGE THICKNESS = 0.0500000 INDICES OF REFRACTION: N1 = 1.00000 N2 = 1.50000 N3 = 1.00000

FOCAL LENGTH FROM STATION ZERO = 4.00000 DELTA BETA= 0.00032

CENTER OF SYM(XC)=-0.07000 CHANGE IN N2(I)= 0.0 ALFAP= 0.0

NOTE:X-COORDINATES HAS BEEN SHIFTED IN CASE=2 BY X2(K) NOW, X2(K)=0.0 ETC.

J	X1 / E	Y1 / THETAE	X2 / THETAO	Y2 / PSI	BETA / PSIO	I2P / RP	I2 / RF	ETA	T	I1P	I1	DYDXT
1	1.0000000	1.0000000	1.0564194	0.9828857	0.3222679	0.0831530	0.0553998	0.2391149	0.0500000	0.4908826	0.7853981	4.1020784
	1.9013081	0.0341402	0.7174545	2.0954809	2.1296225	1.4949541	1.4645472					
2	0.9990687	0.9990683	1.0561848	0.9819179	0.3219482	0.0828245	0.0551812	0.2391236	0.0596354	0.4908826	0.7853981	4.1019230
	1.8995657	0.0344937	0.7170703	2.0955114	2.1302166	1.4941397	1.4632311					
3	0.9987671	0.9987667	1.0559492	0.9809508	0.3216285	0.0818918	0.0545605	0.2397367	0.0692251	0.4908826	0.7853981	4.0910225
	1.8980656	0.0348520	0.7166858	2.0955372	2.1306086	1.4933262	1.4620472					
4	0.9974731	0.9974727	1.0557117	0.9790845	0.3213087	0.0809220	0.0539193	0.2403867	0.0608078	0.4908826	0.7853981	4.0795240
	1.8965807	0.0352097	0.7163020	2.0955639	2.1309872	1.4925127	1.4609755					
5	0.9960730	0.9960726	1.0554752	0.9770174	0.3209890	0.0799776	0.0532468	0.2410114	0.0613955	0.4908826	0.7853981	4.0685310
	1.8950844	0.0355682	0.7159173	2.0955896	2.1313763	1.4916992	1.4598445					
6	0.9958795	0.9958791	1.0552368	0.9760511	0.3206693	0.0790104	0.0526031	0.2416589	0.0619768	0.4908826	0.7853981	4.0571966
	1.8935986	0.0359263	0.7155312	2.0956163	2.1317568	1.4908857	1.4587231					
7	0.9953080	0.9953796	1.0549984	0.9750846	0.3203496	0.0780387	0.0520163	0.2422839	0.0625631	0.4908826	0.7853981	4.0463629
	1.8921032	0.0362849	0.7151483	2.0956421	2.1321459	1.4900722	1.4575930					
8	0.9942871	0.9942867	1.0547609	0.9741187	0.3200299	0.0770658	0.0513688	0.2429341	0.0631440	0.4908826	0.7853981	4.0350447
	1.8906193	0.0366434	0.7147616	2.0956688	2.1325254	1.4892547	1.4564724					
9	0.9934917	0.9934913	1.0545225	0.9731527	0.3197102	0.0760942	0.0507289	0.2435760	0.0637264	0.4908826	0.7853981	4.0239792
	1.8891315	0.0370023	0.7143785	2.0956945	2.1329079	1.4884362	1.4553480					
10	0.9926957	0.9926953	1.0542822	0.9721876	0.3193905	0.0751161	0.0500925	0.2442124	0.0643073	0.4908826	0.7853981	4.0130653
	1.8876419	0.0373602	0.7139941	2.0957212	2.1332922	1.4876128	1.4542227					
11	0.9919010	0.9919006	1.0540469	0.9712223	0.3190708	0.0741347	0.0494445	0.2448561	0.0648864	0.4908826	0.7853981	4.0019140
	1.8861570	0.0377184	0.7136097	2.0957470	2.1336718	1.4867833	1.4531002					
12	0.9911039	0.9911035	1.0538106	0.9702571	0.3187510	0.0731571	0.0488130	0.2454939	0.0654680	0.4908826	0.7853981	3.9912586
	1.8844645	0.0380770	0.7132246	2.0957737	2.1340570	1.4860004	1.4519730					
13	0.9903088	0.9903084	1.0535693	0.9692923	0.3184313	0.0721750	0.0481732	0.2461364	0.0660472	0.4908826	0.7853981	3.9804087
	1.8831769	0.0384356	0.7128396	2.0958000	2.1344423	1.4851913	1.4508445					
14	0.9895176	0.9895172	1.0533152	0.9683287	0.3181117	0.0711929	0.0475194	0.2467988	0.0666207	0.4908826	0.7853981	3.9692822
	1.8816967	0.0387927	0.7124560	2.0958261	2.1348271	1.4843760	1.4497309					
15	0.9887178	0.9887174	1.0530771	0.9673643	0.3177919	0.0702139	0.0468424	0.2474210	0.0672011	0.4908826	0.7853981	3.9580814
	1.8802213	0.0391509	0.7120714	2.0958529	2.1352076	1.4835625	1.4486008					
16	0.9879227	0.9879223	1.0528259	0.9664011	0.3174722	0.0692359	0.0462079	0.2480693	0.0677754	0.4908826	0.7853981	3.9481001
	1.8787466	0.0395077	0.7116879	2.0958796	2.1355867	1.4827461	1.4474773					
17	0.9871269	0.9871264	1.0525799	0.9654380	0.3171525	0.0682434	0.0456091	0.2487091	0.0683487	0.4908826	0.7853981	3.9375124
	1.8772778	0.0398645	0.7113042	2.0959063	2.1359692	1.4819317	1.4463569					
18	0.9863335	0.9863331	1.0523349	0.9644747	0.3168328	0.0672531	0.0449932	0.2493477	0.0691259	0.4908826	0.7853981	3.9501171
	1.8758102	0.0402229	0.7109196	2.0959329	2.1363520	1.4811163	1.4452071					
19	0.9855297	0.9855293	1.0520887	0.9635115	0.3165131	0.0662583	0.0443835	0.2499548	0.0695041	0.4908826	0.7853981	3.9170551
	1.8743361	0.0405806	0.7105349	2.0959597	2.1367443	1.4803019	1.4440447					
20	0.9846482	0.9846479	1.0518466	0.9625483	0.3161934	0.0652661	0.0436122	0.2492473	0.0702727	0.4908826	0.7853981	3.9286509
	1.8727134	0.0409301	0.7101491	2.0959859	2.1371628	1.4794093	1.4425659					
21	0.9839361	0.9839357	1.0516014	0.9615841	0.3158737	0.0646533	0.0430454	0.2512264	0.0706596	0.4908826	0.7853981	3.8964739
	1.8712549	0.0412901	0.7097618	2.0960131	2.1375237	1.4785794	1.4413421					
22	0.9828650	0.9828646	1.0513554	0.9606217	0.3155540	0.0636567	0.0423975	0.2505673	0.0714162	0.4908826	0.7853981	3.9070702
	1.8692522	0.0416488	0.7093771	2.0960393	2.1383430	1.4777514	1.4402256					
23	0.9823527	0.9823523	1.0511074	0.9596591	0.3152342	0.0626607	0.0417495	0.2525375	0.0716012	0.4908826	0.7853981	3.8752670
	1.8682938	0.0420072	0.7089913	2.0960665	2.1387279	1.4769170	1.4390868					
24	0.9812877	0.9812935	1.0508595	0.9586971	0.3149145	0.0616614	0.0411007	0.2518432	0.0725564	0.4908826	0.7853981	3.8656144
	1.8663939	0.0423653	0.7086065	2.0960927	2.1391114	1.4760825	1.4379461					
25	0.9807574	0.9807569	1.0506135	0.9577352	0.3145948	0.0606646	0.0404514	0.2541422	0.0729478	0.4908826	0.7853981	3.8552666
	1.8653078	0.0427235	0.7082208	2.0961203	2.1394972	1.4752481	1.4368053					
26	0.9796953	0.9796949	1.0503616	0.9567733	0.3142751	0.0596699	0.0398020	0.2531793	0.0736963	0.4908826	0.7853981	3.8650150
	1.8633204	0.0430834	0.7078351	2.0961471	2.1398811	1.4744137	1.4356644					
27	0.9789778	0.9789774	1.0501137	0.9558112	0.3139554	0.0586749	0.0391526	0.2537165	0.0742654	0.4908826	0.7853981	3.8564692
	1.8617916	0.0434422	0.7074485	2.0961847	2.1402687	1.4735792	1.4345233					

28	0.9780834	0.9780830	1.0498638	0.9560499	0.3136357	0.0592786	0.0395062	0.2543571	0.0748550	0.4908826	0.7853981	3.8463259
	1.8603048	0.0438012	0.7079628	2.0962114	2.1406651	1.4729748	1.4335699					
29	0.9772938	0.9772934	1.0496130	0.9558848	0.3133160	0.0582901	0.0388479	0.2550259	0.0754203	0.4908826	0.7853981	3.8357906
	1.8588285	0.0441597	0.7066771	2.0962381	2.1410408	1.4721603	1.4324541					
30	0.9764975	0.9764971	1.0493631	0.9549277	0.3129963	0.0573383	0.0382139	0.2556580	0.0759910	0.4908826	0.7853981	3.8258829
	1.8573380	0.0445191	0.7062906	2.0962658	2.1414289	1.4713459	1.4313288					
31	0.9757068	0.9757063	1.0491114	0.9539667	0.3126765	0.0564493	0.0375551	0.2563273	0.0765561	0.4908826	0.7853981	3.8154430
	1.8558548	0.0448781	0.7059045	2.0962925	2.1418047	1.4705305	1.4302111					
32	0.9749172	0.9749168	1.0488635	0.9530057	0.3123568	0.0555664	0.0369005	0.2569504	0.0771214	0.4908826	0.7853981	3.8051510
	1.8543816	0.0452379	0.7055176	2.0963202	2.1421833	1.4697170	1.4290953					
33	0.9741280	0.9741276	1.0486069	0.9520462	0.3120372	0.0546774	0.0362417	0.2576597	0.0776832	0.4908826	0.7853981	3.7948179
	1.8529053	0.0455961	0.7051324	2.0963469	2.1425581	1.4689016	1.4279795					
34	0.9733348	0.9733344	1.0483532	0.9510860	0.3117175	0.0536114	0.0355982	0.2583061	0.0782480	0.4908826	0.7853981	3.7848873
	1.8514214	0.0459550	0.7047463	2.0963745	2.1429405	1.4680862	1.4268589					
35	0.9725419	0.9725415	1.0480995	0.9501263	0.3113977	0.0526395	0.0349508	0.2589583	0.0788124	0.4908826	0.7853981	3.7749176
	1.8499384	0.0463139	0.7043601	2.0964012	2.1433220	1.4672709	1.4257383					
36	0.9717511	0.9717507	1.0478449	0.9491666	0.3110780	0.0516588	0.0342975	0.2596192	0.0793744	0.4908826	0.7853981	3.7648630
	1.8484583	0.0466730	0.7039738	2.0964283	2.1437016	1.4664555	1.4246206					
37	0.9709615	0.9709610	1.0475903	0.9482070	0.3107583	0.0506723	0.0336403	0.2602860	0.0799357	0.4908826	0.7853981	3.7547712
	1.8469820	0.0470322	0.7035872	2.0964556	2.1440843	1.4656410	1.4235048					
38	0.9701679	0.9701675	1.0473356	0.9472476	0.3104386	0.0496888	0.0329883	0.2609298	0.0804995	0.4908826	0.7853981	3.7450743
	1.8454971	0.0473919	0.7032002	2.0964832	2.1444535	1.4648266	1.4223824					
39	0.9693755	0.9693751	1.0470800	0.9462883	0.3101189	0.0487068	0.0323508	0.2615921	0.0810617	0.4908826	0.7853981	3.7352962
	1.8440142	0.0477513	0.7028133	2.0965109	2.1448450	1.4640112	1.4212627					
40	0.9685869	0.9685864	1.0468245	0.9453294	0.3097992	0.0477475	0.0316917	0.2622517	0.0816211	0.4908826	0.7853981	3.7253094
	1.8425379	0.0481111	0.7024261	2.0965385	2.1452217	1.4631958	1.4201479					
41	0.9677944	0.9677939	1.0465689	0.9443705	0.3094795	0.0467723	0.0310419	0.2629072	0.0821832	0.4908826	0.7853981	3.7155809
	1.8410568	0.0484712	0.7020385	2.0965652	2.1456041	1.4623814	1.4190263					
42	0.9670039	0.9670035	1.0463114	0.9434116	0.3091598	0.0457915	0.0303885	0.2635682	0.0827420	0.4908826	0.7853981	3.7058172
	1.8395777	0.0488308	0.7016514	2.0965929	2.1459837	1.4615660	1.4179105					
43	0.9662163	0.9662158	1.0460539	0.9424535	0.3088400	0.0447961	0.0297252	0.2642440	0.0832988	0.4908826	0.7853981	3.6958866
	1.8381042	0.0491905	0.7012642	2.0966206	2.1463585	1.4607506	1.4167876					
44	0.9654291	0.9654287	1.0457926	0.9414963	0.3085203	0.0438066	0.0290663	0.2649137	0.0838513	0.4908826	0.7853981	3.6860933
	1.8366308	0.0495485	0.7008788	2.0966482	2.1467333	1.4599342	1.4156647					
45	0.9646354	0.9646350	1.0455322	0.9405386	0.3082006	0.0428169	0.0284198	0.2655637	0.0844093	0.4908826	0.7853981	3.6766348
	1.8351603	0.0499074	0.7004922	2.0966759	2.1471157	1.4591169	1.4145632					
46	0.9638438	0.9638433	1.0452738	0.9395810	0.3078809	0.0418622	0.0277704	0.2662188	0.0849677	0.4908826	0.7853981	3.6671476
	1.8336858	0.0502674	0.7001044	2.0967035	2.1474981	1.4583025	1.4134445					
47	0.9630533	0.9630529	1.0450134	0.9386237	0.3075612	0.0408837	0.0271183	0.2668775	0.0855234	0.4908826	0.7853981	3.6576519
	1.8321867	0.0506269	0.6997172	2.0967312	2.1478786	1.4574871	1.4123268					
48	0.9622607	0.9622603	1.0447531	0.9376661	0.3072415	0.0397111	0.0264702	0.2675304	0.0860806	0.4908826	0.7853981	3.6482868
	1.8307047	0.0509869	0.6993294	2.0967588	2.1482611	1.4566708	1.4112072					
49	0.9614719	0.9614714	1.0444927	0.9367090	0.3069218	0.0387270	0.0258144	0.2681948	0.0866351	0.4908826	0.7853981	3.6388025
	1.8292284	0.0513471	0.6989414	2.0967865	2.1486406	1.4558563	1.4100924					
50	0.9606817	0.9606813	1.0442305	0.9357521	0.3066021	0.0377401	0.0251567	0.2688620	0.0871886	0.4908826	0.7853981	3.6293249
	1.8277502	0.0517067	0.6985539	2.0968151	2.1490192	1.4550430	1.4089755					
51	0.9598919	0.9598914	1.0439682	0.9347956	0.3062823	0.0367646	0.0245067	0.2695178	0.0877419	0.4908826	0.7853981	3.6200523
	1.8262711	0.0520665	0.6981663	2.0968428	2.1493997	1.4542236	1.4078588					
52	0.9590999	0.9590995	1.0437050	0.9338392	0.3059627	0.0357860	0.0238545	0.2701766	0.0882955	0.4908826	0.7853981	3.6107807
	1.8247910	0.0524263	0.6977786	2.0968704	2.1497822	1.4533973	1.4067402					
53	0.9583049	0.9583095	1.0434418	0.9328830	0.3056430	0.0348020	0.0232048	0.2708409	0.0888478	0.4908826	0.7853981	3.6014786
	1.8233128	0.0527864	0.6973905	2.0968981	2.1501617	1.4525909	1.4056234					
54	0.9575221	0.9575217	1.0431787	0.9319271	0.3053232	0.0338146	0.0225606	0.2715086	0.0893968	0.4908826	0.7853981	3.5921736
	1.8218384	0.0531457	0.6970031	2.0969257	2.1505394	1.4517846	1.4045195					
55	0.9567270	0.9567266	1.0429125	0.9309712	0.3050035	0.0328334	0.0219101	0.2721502	0.0899515	0.4908826	0.7853981	3.5832739
	1.8203516	0.0535058	0.6966159	2.0969543	2.1509266	1.4509583	1.4033861					
56	0.9559407	0.9559403	1.0426464	0.9300153	0.3046838	0.0318549	0.0212646	0.2728249	0.0904983	0.4908826	0.7853981	3.5739031
	1.8188801	0.0538654	0.6962273	2.0969830	2.1513004	1.4501416	1.4022751					
57	0.9551498	0.9551494	1.0423803	0.9290606	0.3043641	0.0308759	0.0206221	0.2734682	0.0910482	0.4908826	0.7853981	3.5648441
	1.8174019	0.0542251	0.6958393	2.0970116	2.1516819	1.4493246	1.4011574					
58	0.9543593	0.9543589	1.0421143	0.9281051	0.3040444	0.0298973	0.0199824	0.2741471	0.0915980	0.4908826	0.7853981	3.5558329
	1.8159218	0.0545855	0.6954508	2.0970402	2.1520643	1.4485083	1.4000417					
59	0.9535733	0.9535729	1.0418472	0.9271504	0.3037247	0.0289189	0.0193465	0.2748258	0.0921435	0.4908826	0.7853981	3.5465946
	1.8144512	0.0549455	0.6950626	2.0970689	2.1524491	1.4476919	1.3989286					
60	0.9527851	0.9527847	1.0415783	0.9261959	0.3034050	0.0279407	0.0187145	0.2754963	0.0926887	0.4908826	0.7853981	3.5375118
	1.8129759	0.0553048	0.6946751	2.0970955	2.1528358	1.4468737	1.3978148					
61	0.9519916	0.9519912	1.0413094	0.9252415	0.3030853	0.0269615	0.0180936	0.2761381	0.0932373	0.4908826	0.7853981	3.5286582
	1.8114910	0.0556645	0.6942871	2.0971241	2.1532250	1.4460564	1.3966432					
62	0.9511932	0.9511928	1.0410404	0.9242874	0.3027655	0.0259842	0.0174851	0.2767914	0.0937852	0.4908826	0.7853981	3.5200901
	1.8100090	0.0560244	0.6938987	2.0971527	2.1536164	1.4452391	1.3954736					
63	0.9504098	0.9504094	1.0407715	0.9233331	0.3024458	0.0249923	0.0168666	0.2774535	0.0943302	0.4908826	0.7853981	3.5112429
	1.8085327	0.0563844	0.6935104	2.0971804	2.1539669	1.4444218	1.3943078					

64	0.9496241	0.9496236	1.0405006	0.9223794	0.3021261	0.0239876	0.0159909	0.2781385	0.0948725	0.4908826	0.7853981	3.5021362
	1.8070631	0.0567445	0.6931218	2.0972090	2.1543407	1.4436045	1.3933477					
65	0.9488304	0.9488300	1.0402298	0.9214256	0.3018064	0.0230289	0.0153518	0.2787775	0.0954193	0.4908826	0.7853981	3.4936781
	1.8055773	0.0571066	0.6927332	2.0972376	2.1547289	1.4427872	1.3922453					
66	0.9480422	0.9480418	1.0399580	0.9204723	0.3014867	0.0220388	0.0146919	0.2794480	0.0959614	0.4908826	0.7853981	3.4848452
	1.8041029	0.0574665	0.6923448	2.0972662	2.1551065	1.4419689	1.3911114					
67	0.9472535	0.9472531	1.0396852	0.9195194	0.3011670	0.0210540	0.0140355	0.2801130	0.0965027	0.4908826	0.7853981	3.4761248
	1.8026266	0.0578241	0.6919566	2.0972948	2.1554861	1.4411507	1.3899965					
68	0.9464628	0.9464623	1.0394125	0.9185661	0.3008473	0.0200666	0.0133772	0.2807807	0.0970456	0.4908826	0.7853981	3.4674082
	1.8011494	0.0581841	0.6915679	2.0973234	2.1558657	1.4403324	1.3888798					
69	0.9456740	0.9456736	1.0391388	0.9176133	0.3005276	0.0190847	0.0127227	0.2814429	0.0975861	0.4908826	0.7853981	3.4588051
	1.7996731	0.0585440	0.6911794	2.0973520	2.1562462	1.4395142	1.3877649					
70	0.9448849	0.9448845	1.0388641	0.9166617	0.3002079	0.0180998	0.0120661	0.2821081	0.0981257	0.4908826	0.7853981	3.4502020
	1.7981958	0.0589037	0.6907911	2.0973806	2.1566267	1.4386959	1.3866491					
71	0.9440962	0.9440958	1.0385885	0.9157088	0.2998881	0.0171095	0.0114060	0.2827787	0.0986642	0.4908826	0.7853981	3.4415684
	1.7967215	0.0592632	0.6904028	2.0974092	2.1570044	1.4378767	1.3855352					
72	0.9433079	0.9433075	1.0383129	0.9147571	0.2995685	0.0161220	0.0107478	0.2834464	0.0992022	0.4908826	0.7853981	3.4330111
	1.7952471	0.0596229	0.6900143	2.0974379	2.1573830	1.4370584	1.3844206					
73	0.9425184	0.9425179	1.0380354	0.9138054	0.2992488	0.0151402	0.0100933	0.2841085	0.0997392	0.4908826	0.7853981	3.4245653
	1.7937689	0.0599821	0.6896263	2.0974674	2.1577635	1.4362383	1.3833046					
74	0.9417301	0.9417297	1.0377579	0.9128541	0.2989290	0.0141524	0.0094348	0.2847766	0.1002753	0.4908826	0.7853981	3.4160814
	1.7922945	0.0603415	0.6892380	2.0974960	2.1581421	1.4354191	1.3821907					
75	0.9409389	0.9409385	1.0374804	0.9119024	0.2986093	0.0131763	0.0087841	0.2854331	0.1008134	0.4908826	0.7853981	3.4077835
	1.7908134	0.0607015	0.6888493	2.0975246	2.1585255	1.4345999	1.3810720					
76	0.9401515	0.9401510	1.0372019	0.9109511	0.2982896	0.0121856	0.0081235	0.2861040	0.1013480	0.4908826	0.7853981	3.3993397
	1.7893400	0.0610613	0.6884603	2.0975542	2.1589041	1.4337807	1.3799591					
77	0.9393612	0.9393607	1.0369225	0.9100003	0.2979699	0.0112037	0.0074691	0.2867662	0.1018835	0.4908826	0.7853981	3.3910437
	1.7878618	0.0614207	0.6880718	2.0975828	2.1592846	1.4329605	1.3788424					
78	0.9385720	0.9385716	1.0366430	0.9090496	0.2976502	0.0102169	0.0068145	0.2874313	0.1024181	0.4908826	0.7853981	3.3827496
	1.7863865	0.0617804	0.6876830	2.0976124	2.1596651	1.4321413	1.3777215					
79	0.9377892	0.9377798	1.0363636	0.9080988	0.2973305	0.0092487	0.0061659	0.2880818	0.1029546	0.4908826	0.7853981	3.3746738
	1.7849045	0.0621407	0.6872935	2.0976419	2.1600504	1.4313221	1.3766079					
80	0.9369937	0.9369932	1.0360832	0.9071482	0.2970108	0.0082521	0.0055014	0.2887586	0.1034865	0.4908826	0.7853981	3.3663063
	1.7834330	0.0625004	0.6869043	2.0976706	2.1604271	1.4305019	1.3754969					
81	0.9362066	0.9362062	1.0358019	0.9061979	0.2966911	0.0072557	0.0048371	0.2894353	0.1040178	0.4908826	0.7853981	3.3579807
	1.7819614	0.0628607	0.6865152	2.0976992	2.1608038	1.4296818	1.3743839					
82	0.9354128	0.9354124	1.0355206	0.9052476	0.2963713	0.0062909	0.0041939	0.2900804	0.1045536	0.4908826	0.7853981	3.3500786
	1.7804766	0.0632210	0.6861255	2.0977287	2.1611819	1.4288626	1.3732624					
83	0.9346259	0.9346255	1.0352373	0.9042980	0.2960516	0.0052947	0.0035298	0.2907569	0.1050829	0.4908826	0.7853981	3.3418293
	1.7790041	0.0635807	0.6857366	2.0977583	2.1615646	1.4280415	1.3721504					
84	0.9338402	0.9338398	1.0349541	0.9033484	0.2957320	0.0042956	0.0028638	0.2914363	0.1056112	0.4908826	0.7853981	3.3335810
	1.7775345	0.0639406	0.6853473	2.0977879	2.1619444	1.4272213	1.3710403					
85	0.9330494	0.9330490	1.0346708	0.9023988	0.2954122	0.0032963	0.0021978	0.2920930	0.1061431	0.4908826	0.7853981	3.3256445
	1.7760553	0.0643009	0.6849576	2.0978165	2.1623278	1.4264011	1.3699226					
86	0.9322072	0.9322068	1.0343857	0.9014497	0.2950925	0.0023274	0.0015515	0.2915551	0.1066414	0.4908826	0.7853981	3.3320208
	1.7741641	0.0646510	0.6845686	2.0978556	2.1631060	1.4255800	1.3684492					
87	0.9314395	0.9314390	1.0341024	0.9005001	0.2947728	0.0014964	0.0009976	0.2932744	0.1072236	0.4908826	0.7853981	3.3114519
	1.7730427	0.0650204	0.6841779	2.0978775	2.1634843	1.4247599	1.3676472					
88	0.9306381	0.9306377	1.0338163	0.8995513	0.2944531	0.0015147	0.0010098	0.2929384	0.1078936	0.4908826	0.7853981	3.3154774
	1.7711697	0.0653723	0.6837865	2.0979147	2.1638646	1.4239388	1.3663319					
89	0.9298625	0.9298621	1.0335312	0.8986019	0.2941334	-0.0006802	-0.0003201	0.2946135	0.1082792	0.4908826	0.7853981	3.2954988
	1.7700930	0.0657413	0.6833980	2.0979357	2.1642398	1.4231176	1.3654184					
90	0.9288921	0.9288917	1.0332432	0.8976540	0.2938136	-0.0036668	-0.0024045	0.2944205	0.1089263	0.4908826	0.7853981	3.2977905
	1.7683762	0.0660937	0.6830091	2.0979729	2.1646170	1.4222965	1.3640471					
91	0.9280448	0.9280444	1.0329561	0.8967056	0.2934946	-0.0031996	-0.0020833	0.2948139	0.1094921	0.4908826	0.7853981	3.2931242
	1.7666912	0.0664518	0.6826187	2.0980083	2.1650391	1.4214745	1.3628492					
92	0.9272441	0.9272436	1.0326691	0.8957571	0.2931743	-0.0027445	-0.0017864	0.2954188	0.1100265	0.4908826	0.7853981	3.2859735
	1.7651930	0.0668122	0.6822284	2.0980344	2.1654436	1.4206543	1.3617172					
93	0.9264706	0.9264702	1.0323831	0.8948089	0.2928545	-0.0033066	-0.0022044	0.2961612	0.1105407	0.4908826	0.7853981	3.2772369
	1.7637463	0.0671730	0.6818384	2.0980644	2.1657963	1.4198322	1.3606243					
94	0.9256905	0.9256901	1.0320921	0.8938609	0.2925348	-0.0043346	-0.0028898	0.2966595	0.1110603	0.4908826	0.7853981	3.2689409
	1.7622871	0.0675344	0.6814476	2.0980930	2.1661644	1.4190111	1.3595219					
95	0.9249180	0.9249176	1.0318031	0.8929139	0.2922151	-0.0053993	-0.0035995	0.2971744	0.1115739	0.4908826	0.7853981	3.2602568
	1.7608433	0.0678958	0.6810568	2.0981226	2.1665201	1.4181903	1.3584309					
96	0.9241395	0.9241391	1.0315142	0.8919650	0.2918954	-0.0064124	-0.0042749	0.2976829	0.1120914	0.4908826	0.7853981	3.2519732
	1.7593861	0.0682576	0.6806656	2.0981522	2.1668863	1.4173679	1.3573305					
97	0.9233772	0.9233768	1.0312233	0.8910177	0.2915757	-0.0074405	-0.0049603	0.2981863	0.1125961	0.4908826	0.7853981	3.2428761
	1.7579594	0.0686190	0.6802751	2.0981817	2.1672608	1.4165459	1.3562527					
98	0.9226059	0.9226055	1.0309324	0.8900704	0.2912560	-0.0084686	-0.0056457	0.2986840	0.1131069	0.4908826	0.7853981	3.2342777
	1.7565165	0.0689806	0.6798841	2.0982103	2.1676416	1.4157238	1.3551626					
99	0.9218428	0.9218424	1.0306436	0.8891236	0.2909363	-0.0094971	-0.0063311	0.2991759	0.1136131	0.4908826	0.7853981	3.2252398
	1.7550888	0.0693417	0.6794939	2.0982389	2.1679220	1.4149017	1.3540730					

100	0.9210676	0.9210672	1.0303469	0.8881770	0.2906166-0.0107699-0.0071799	0.3013865	0.1141216	0.4908826	0.7853981	3.2169228
	1.7536392	0.0697028	0.6791033	2.0982695	2.1682816 1.4140787 1.3529492					
101	0.9203022	0.9203018	1.0310531	0.8872305	0.2902969-0.0118634-0.0079088	0.3021603	0.1146254	0.4908826	0.7853981	3.2081633
	1.7522058	0.0700640	0.6787127	2.0982990	2.1686277 1.4132557 1.3519068					
102	0.9195278	0.9195274	1.0297585	0.8862839	0.2899771-0.0129198-0.0086130	0.3028969	0.1151344	0.4908826	0.7853981	3.1998644
	1.7507582	0.0704251	0.6781220	2.0983286	2.1689854 1.4124327 1.3508129					
103	0.9185042	0.9185038	1.0294647	0.8853375	0.2896574-0.0128032-0.0085323	0.3024576	0.1158112	0.4908826	0.7853981	3.2048082
	1.7488432	0.0707772	0.6779305	2.0983677	2.1693769 1.4116106 1.3493662					
104	0.9178941	0.9178937	1.0291700	0.8843914	0.2893178-0.0146260-0.0097504	0.3039637	0.1162098	0.4908826	0.7853981	3.1879148
	1.7477016	0.0711451	0.6775392	2.0983915	2.1698389 1.4107876 1.3485341					
105	0.9169879	0.9169875	1.0288734	0.8834458	0.2890180-0.0150614-0.0100407	0.3040795	0.1168050	0.4908826	0.7853981	3.1866236
	1.7460070	0.0715008	0.6771485	2.0984259	2.1704044 1.4099636 1.3472233					
106	0.9161142	0.9161138	1.0285769	0.8824999	0.2886983-0.0156456-0.0104301	0.3043439	0.1173786	0.4908826	0.7853981	3.1836758
	1.7443714	0.0718583	0.6767573	2.0984602	2.1709204 1.4091406 1.3459883					
107	0.9155551	0.9155546	1.0282803	0.8815541	0.2883786-0.0177148-0.0118095	0.3060934	0.1177413	0.4908826	0.7853981	3.1643019
	1.7433252	0.0722285	0.6763655	2.0984812	2.1709423 1.4083166 1.3451977					
108	0.9147711	0.9147707	1.0279827	0.8806087	0.2880589-0.0187252-0.0124831	0.3067841	0.1182536	0.4908826	0.7853981	3.1567116
	1.7418594	0.0725896	0.6759741	2.0985117	2.1713161 1.4074926 1.3440905					
109	0.9140377	0.9140373	1.0276842	0.8796633	0.2877392-0.0199731-0.0133149	0.3077123	0.1187311	0.4908826	0.7853981	3.1465645
	1.7404871	0.0729526	0.6755826	2.0985403	2.1716118 1.4066687 1.3429525					
110	0.9133577	0.9133573	1.0273848	0.8787187	0.2874195-0.0214667-0.0143135	0.3086862	0.1191721	0.4908826	0.7853981	3.1338148
	1.7392139	0.0733173	0.6751915	2.0985670	2.1718265 1.4058447 1.3420925					
111	0.9127256	0.9127252	1.0270844	0.8777741	0.2870998-0.0231692-0.0154587	0.3102890	0.1195805	0.4908826	0.7853981	3.1187019
	1.7380314	0.0736839	0.6748003	2.0985909	2.1719608 1.4050198 1.3411949					
112	0.9118803	0.9118798	1.0267820	0.8768299	0.2867801-0.0239164-0.0159434	0.3106965	0.1201288	0.4908826	0.7853981	3.1143370
	1.7364511	0.0740415	0.6744097	2.0986242	2.1724291 1.4041939 1.3400349					
113	0.9110806	0.9110802	1.0264797	0.8758860	0.2864603-0.0248497-0.0165665	0.3113100	0.1206465	0.4908826	0.7853981	3.1077852
	1.7349548	0.0744010	0.6740190	2.0986557	2.1728277 1.4033680 1.3386748					
114	0.9102969	0.9102965	1.0261765	0.8749419	0.2861406-0.0258599-0.0172389	0.3120005	0.1211528	0.4908826	0.7853981	3.1004410
	1.7334881	0.0747615	0.6736280	2.0986862	2.1732016 1.4025421 1.3377066					
115	0.9095206	0.9095201	1.0258732	0.8739982	0.2858209-0.0269075-0.0179372	0.3127284	0.1216542	0.4908826	0.7853981	3.0927334
	1.7320356	0.0751224	0.6732367	2.0987167	2.1735640 1.4017162 1.3366699					
116	0.9087515	0.9087511	1.0255690	0.8730549	0.2855012-0.0279861-0.0186561	0.3134874	0.1221496	0.4908826	0.7853981	3.0847330
	1.7305975	0.0754832	0.6728457	2.0987463	2.1739149 1.4008904 1.3355827					
117	0.9079807	0.9079803	1.0252638	0.8721113	0.2851815-0.0290620-0.0193732	0.3142436	0.1226454	0.4908826	0.7853981	3.0768013
	1.7291555	0.0758442	0.6724545	2.0987768	2.1742668 1.4000635 1.3344936					
118	0.9072080	0.9072075	1.0249586	0.8711680	0.2848618-0.0301208-0.0200788	0.3149826	0.1231424	0.4908826	0.7853981	3.0690832
	1.7277098	0.0762053	0.6720629	2.0988073	2.1746294 1.3992376 1.3334017					
119	0.9064395	0.9064391	1.0246575	0.8702250	0.2845421-0.0312025-0.0207998	0.3157446	0.1236356	0.4908826	0.7853981	3.0611620
	1.7262716	0.0765664	0.6716716	2.0988379	2.1749754 1.3984108 1.3323154					
120	0.9056753	0.9056749	1.0243444	0.8692823	0.2842224-0.0323098-0.0215378	0.3165321	0.1241241	0.4908826	0.7853981	3.0530138
	1.7248430	0.0769271	0.6712807	2.0988674	2.1753168 1.3975840 1.3312359					
121	0.9048987	0.9048983	1.0240374	0.8683397	0.2839026-0.0333513-0.0222319	0.3172539	0.1246216	0.4908826	0.7853981	3.0455809
	1.7233896	0.0772883	0.6708889	2.0988979	2.1756811 1.3967571 1.3301382					
122	0.9041256	0.9041252	1.0237293	0.8673967	0.2835829-0.0344127-0.0229393	0.3179956	0.1251161	0.4908826	0.7853981	3.0379763
	1.7219429	0.0776495	0.6704971	2.0989285	2.1760378 1.3959293 1.3290453					
123	0.9033605	0.9033601	1.0234203	0.8664547	0.2832633-0.0355111-0.0236713	0.3187744	0.1256040	0.4908826	0.7853981	3.0300293
	1.7205114	0.0780104	0.6701057	2.0989590	2.1763830 1.3951025 1.3279638					
124	0.9023332	0.9023329	1.0231104	0.8655128	0.2829435-0.0365746-0.0243863	0.3183181	0.1262649	0.4908826	0.7853981	3.0346813
	1.7185898	0.0783611	0.6697142	2.0990003	2.1771343 1.3942747 1.3265123					
125	0.9017286	0.9017282	1.0228004	0.8645704	0.2826238-0.0372282-0.0248157	0.3198521	0.1266455	0.4908826	0.7853981	3.0190935
	1.7174587	0.0787290	0.6693221	2.0990238	2.1772327 1.3934469 1.3256578					
126	0.9007460	0.9007456	1.0224905	0.8636283	0.2823041-0.0383057-0.0255372	0.3196098	0.1272769	0.4908826	0.7853981	3.0215454
	1.7156200	0.0790824	0.6689297	2.0990629	2.1779194 1.3926191 1.3242693					
127	0.9001682	0.9001674	1.0221796	0.8626863	0.2819844-0.0392847-0.0261863	0.3212691	0.1276387	0.4908826	0.7853981	3.0048208
	1.7145395	0.0794517	0.6685373	2.0990868	2.1779709 1.3917913 1.3234525					
128	0.8991715	0.8991711	1.0218678	0.8617448	0.2816647-0.0402996-0.0268655	0.3209643	0.1282774	0.4908826	0.7853981	3.0078802
	1.7126760	0.0798041	0.6681451	2.0991259	2.1786785 1.3909626 1.3220944					
129	0.8983552	0.8983548	1.0215569	0.8608033	0.2813450-0.0413551-0.0275661	0.3215301	0.1287975	0.4908826	0.7853981	3.0025053
	1.7111473	0.0801646	0.6677518	2.0991592	2.1791058 1.3901348 1.3207264					
130	0.8975670	0.8975666	1.0212431	0.8598619	0.2810253-0.0424449-0.0282657	0.3221702	0.1292958	0.4908826	0.7853981	2.9958076
	1.7096729	0.0805259	0.6673598	2.0991907	2.1795872 1.3893061 1.3193765					
131	0.8967773	0.8967769	1.0209333	0.8589208	0.2807056-0.0435536-0.0289721	0.3228312	0.1297962	0.4908826	0.7853981	2.9892282
	1.7081957	0.0808862	0.6669667	2.0992222	2.1798725 1.3884783 1.3180607					
132	0.8959895	0.8959891	1.0206156	0.8579795	0.2803859-0.0446214-0.0296727	0.3235572	0.1302935	0.4908826	0.7853981	2.9825239
	1.7067213	0.0812471	0.6665741	2.0992546	2.1802530 1.3876486 1.3167448					
133	0.8951993	0.8951989	1.0203009	0.8570384	0.2800661-0.0456850-0.0303680	0.3241711	0.1307923	0.4908826	0.7853981	2.9759684
	1.7052441	0.0816082	0.6661811	2.0992861	2.1806374 1.3868198 1.3154313					
134	0.8944097	0.8944092	1.0199862	0.8560977	0.2797464-0.0453860-0.0310516	0.3248324	0.1312906	0.4908826	0.7853981	2.9694624
	1.7037659	0.0819696	0.6657878	2.0993176	2.1810226 1.3859911 1.3141143					
135	0.8936242	0.8936238	1.0196705	0.8551570	0.2794267-0.0466870-0.0317165	0.3255137	0.1317853	0.4908826	0.7853981	2.9627886
	1.7022951	0.0823311	0.6653945	2.0993500	2.1814022 1.3851624 1.3127942					

136	0.8928342	0.8928338	1.0193539	0.8542167	0.2791070	-0.0470731	-0.0313756	0.3261802	0.1322819	0.4908826	0.7853981	2.9562845
	1.7008190	0.0826922	0.6650014	2.0993814	2.1817856	1.3843327	1.3130884					
137	0.8920417	0.8920413	1.0190372	0.8532760	0.2787873	-0.0480428	-0.0320217	0.3268301	0.1327803	0.4908826	0.7853981	2.9499664
	1.6993361	0.0830539	0.6646075	2.0994139	2.1821756	1.3835030	1.3119678					
138	0.8912580	0.8912576	1.0187197	0.8523359	0.2784676	-0.0490549	-0.0326963	0.3275225	0.1332718	0.4908826	0.7853981	2.9432611
	1.6978693	0.0834154	0.6642140	2.0994463	2.1825514	1.3826733	1.3108606					
139	0.8904667	0.8904663	1.0184021	0.8513956	0.2781479	-0.0500326	-0.0333473	0.3281805	0.1337683	0.4908826	0.7853981	2.9369164
	1.6963892	0.0837774	0.6638198	2.0994778	2.1829386	1.3818436	1.3097420					
140	0.8896797	0.8896793	1.0180836	0.8504553	0.2778282	-0.0510276	-0.0340102	0.3288558	0.1342612	0.4908826	0.7853981	2.9304295
	1.6949167	0.0841393	0.6634257	2.0995102	2.1833300	1.3810139	1.3086303					
141	0.8888940	0.8888935	1.0177631	0.8495159	0.2775084	-0.0520340	-0.0346807	0.3295425	0.1347511	0.4908826	0.7853981	2.9238586
	1.6934471	0.0845005	0.6630324	2.0995426	2.1836977	1.3801832	1.3075179					
142	0.8881058	0.8881053	1.0174427	0.8485767	0.2771888	-0.0530257	-0.0353412	0.3302144	0.1352426	0.4908826	0.7853981	2.9174547
	1.6919727	0.0848619	0.6626387	2.0995750	2.1840901	1.3793526	1.3064060					
143	0.8873146	0.8873141	1.0171213	0.8476372	0.2768691	-0.0540034	-0.0359926	0.3308725	0.1357352	0.4908826	0.7853981	2.9112072
	1.6904926	0.0852233	0.6622449	2.0996075	2.1844664	1.3785210	1.3052883					
144	0.8865239	0.8865235	1.0167999	0.8466978	0.2765493	-0.0549839	-0.0366457	0.3315332	0.1362275	0.4908826	0.7853981	2.9049587
	1.6890135	0.0855851	0.6618506	2.0996399	2.1848536	1.3776903	1.3041706					
145	0.8857331	0.8857327	1.0164785	0.8457583	0.2762296	-0.0559670	-0.0373005	0.3321966	0.1367198	0.4908826	0.7853981	2.8987103
	1.6875343	0.0859473	0.6614558	2.0996723	2.1852398	1.3768587	1.3030529					
146	0.8849465	0.8849461	1.0161562	0.8448192	0.2759099	-0.0569645	-0.0379649	0.3328744	0.1372084	0.4908826	0.7853981	2.8923492
	1.6860619	0.0863096	0.6610610	2.0997047	2.1856213	1.3760281	1.3019409					
147	0.8841598	0.8841594	1.0158329	0.8438802	0.2755902	-0.0579546	-0.0386313	0.3335548	0.1376961	0.4908826	0.7853981	2.8859892
	1.6845903	0.0866717	0.6606664	2.0997372	2.1860018	1.3751965	1.3008289					
148	0.8833729	0.8833725	1.0155087	0.8429417	0.2752705	-0.0589390	-0.0392933	0.3342295	0.1381829	0.4908826	0.7853981	2.8797064
	1.6831179	0.0870335	0.6602721	2.0997696	2.1863832	1.3743649	1.2997169					
149	0.8825823	0.8825819	1.0151834	0.8420035	0.2749508	-0.0599447	-0.0399498	0.3348955	0.1386711	0.4908826	0.7853981	2.8735294
	1.6816387	0.0873950	0.6598778	2.0998030	2.1867685	1.3735323	1.2986002					
150	0.8817908	0.8817904	1.0148582	0.8410646	0.2746311	-0.0609218	-0.0406005	0.3355529	0.1391600	0.4908826	0.7853981	2.8674545
	1.6801586	0.0877572	0.6594826	2.0998354	2.1871567	1.3726997	1.2974815					
151	0.8810013	0.8810009	1.0145321	0.8401262	0.2743114	-0.0619079	-0.0412574	0.3362193	0.1396467	0.4908826	0.7853981	2.8613214
	1.6786804	0.0881194	0.6590877	2.0998688	2.1875420	1.3718672	1.2963657					
152	0.8802161	0.8802156	1.0142050	0.8391882	0.2739916	-0.0628761	-0.0419206	0.3369077	0.1401295	0.4908826	0.7853981	2.8550091
	1.6771127	0.0884814	0.6586928	2.0999012	2.1879276	1.3710346	1.2952565					
153	0.8794284	0.8794280	1.0138779	0.8382501	0.2736719	-0.0638133	-0.0425928	0.3375852	0.1406139	0.4908826	0.7853981	2.8488216
	1.6757402	0.0888437	0.6582976	2.0999336	2.1883111	1.3702021	1.2941437					
154	0.8786372	0.8786368	1.0135498	0.8373122	0.2733522	-0.0647491	-0.0432652	0.3382453	0.1410997	0.4908826	0.7853981	2.8428164
	1.6742582	0.0892053	0.6579023	2.0999670	2.1886892	1.3693696	1.2930250					
155	0.8778494	0.8778490	1.0132208	0.8363748	0.2730325	-0.0656867	-0.0439367	0.3389192	0.1415822	0.4908826	0.7853981	2.8367071
	1.6727848	0.0895679	0.6575074	2.1000004	2.1890717	1.3685350	1.2919121					
156	0.8770599	0.8770595	1.0128938	0.8354372	0.2727128	-0.0666756	-0.0445649	0.3395879	0.1420649	0.4908826	0.7853981	2.8306694
	1.6713085	0.0899299	0.6571122	2.1000338	2.1894560	1.3677015	1.2907953					
157	0.8762698	0.8762694	1.0125668	0.8344997	0.2723931	-0.0676602	-0.0452208	0.3402533	0.1425490	0.4908826	0.7853981	2.8246841
	1.6698294	0.0902926	0.6567162	2.1000662	2.1898432	1.3668680	1.2896775					
158	0.8754831	0.8754827	1.0122339	0.8335626	0.2720734	-0.0686358	-0.0458844	0.3409302	0.1430289	0.4908826	0.7853981	2.8186169
	1.6683569	0.0906549	0.6563209	2.1000996	2.1902296	1.3660336	1.2885575					
159	0.8746927	0.8746923	1.0119099	0.8326253	0.2717537	-0.0696419	-0.0465401	0.3415955	0.1435112	0.4908826	0.7853981	2.8126774
	1.6668787	0.0910175	0.6559248	2.1001329	2.1906158	1.3651990	1.2874364					
160	0.8739043	0.8739039	1.0115841	0.8316882	0.2714339	-0.0706385	-0.0472037	0.3422725	0.1439912	0.4908826	0.7853981	2.8066559
	1.6654043	0.0913801	0.6555289	2.1001663	2.1909993	1.3643636	1.2863139					
161	0.8731133	0.8731126	1.0112552	0.8307514	0.2711143	-0.0716176	-0.0478555	0.3429319	0.1444722	0.4908826	0.7853981	2.8008137
	1.6639233	0.0917426	0.6551330	2.1001997	2.1913824	1.3635302	1.2851882					
162	0.8723247	0.8723233	1.0109024	0.8298146	0.2707946	-0.0725955	-0.0484939	0.3436001	0.1449519	0.4908826	0.7853981	2.7949142
	1.6624479	0.0921054	0.6547366	2.1002331	2.1917677	1.3626966	1.2840594					
163	0.8715358	0.8715354	1.0105806	0.8288780	0.2704749	-0.0735716	-0.0491302	0.3442764	0.1454296	0.4908826	0.7853981	2.7889662
	1.6609735	0.0924681	0.6543405	2.1002665	2.1921511	1.3618612	1.2829269					
164	0.8705491	0.8705487	1.0102339	0.8279412	0.2701551	-0.0745460	-0.0497643	0.3438291	0.1460051	0.4908826	0.7853981	2.7928972
	1.6594952	0.0928308	0.6539441	2.1003000	2.1925342	1.3610254	1.2817910					
165	0.8697195	0.8697191	1.0099001	0.8270040	0.2698354	-0.0755028	-0.0503752	0.3454342	0.1464811	0.4908826	0.7853981	2.7788000
	1.6579494	0.0931931	0.6535467	2.1003334	2.1929217	1.3601913	1.2806545					
166	0.8689209	0.8689204	1.0095634	0.8260665	0.2695157	-0.0764662	-0.0509774	0.3461219	0.1470259	0.4908826	0.7853981	2.7815609
	1.6560802	0.0935465	0.6531506	2.1003670	2.1933060	1.3593540	1.2795140					
167	0.8681404	0.8681400	1.0092267	0.8251318	0.2691960	-0.0774233	-0.0516135	0.3467793	0.1473650	0.4908826	0.7853981	2.7671471
	1.6549950	0.0939195	0.6527524	2.1004004	2.1936932	1.3585196	1.2783719					
168	0.8673339	0.8673335	1.0088911	0.8241961	0.2688763	-0.0783795	-0.0516733	0.3474253	0.1479040	0.4908826	0.7853981	2.7702103
	1.6531124	0.0942778	0.6523564	2.1004467	2.1940799	1.3576832	1.2770519					
169	0.8665270	0.8665265	1.0085545	0.8232601	0.2685565	-0.0793371	-0.0522747	0.3470157	0.1484715	0.4908826	0.7853981	2.7651186
	1.6516327	0.0946357	0.6519597	2.1004815	2.1944658	1.3568478	1.2759115					
170	0.8657341	0.8657337	1.0082159	0.8223243	0.2682369	-0.0802930	-0.0529229	0.3476069	0.1489478	0.4908826	0.7853981	2.7594824
	1.6501179	0.0949987	0.6515616	2.1005156	2.1948534	1.3560139	1.2747706					
171	0.8649369	1.8649365	1.0078764	0.8213884	0.2679172	-0.0812487	-0.0535683	0.3481927	0.1494259	0.4908826	0.7853981	2.7540121
	1.6486273	0.0953613	0.6511647	2.1005497	2.1952425	1.3551791	1.2736245					

172	0.8641446	0.8641441	1.0075378	0.8204529	0.2675974	-0.0813587	-0.0542059	0.3489561	0.1499018	0.4908826	0.7853981	2.7484150
	1.6471453	0.0957252	0.6507665	2.1005840	2.1960745	1.3543377	1.2725449					
173	0.8633481	0.8633476	1.0071993	0.8195171	0.2672777	-0.0823141	-0.0548416	0.3495919	0.1503805	0.4908826	0.7853981	2.7429867
	1.6456337	0.0960893	0.6503680	2.1006184	2.1964731	1.3535013	1.2714186					
174	0.8625570	0.8625565	1.0068588	0.8185819	0.2669581	-0.0832978	-0.0554962	0.3502559	0.1508535	0.4908826	0.7853981	2.7373362
	1.6441746	0.0964528	0.6499701	2.1006527	2.1968613	1.3526640	1.2703009					
175	0.8617619	0.8617615	1.0065174	0.8176466	0.2666383	-0.0842648	-0.0561395	0.3509031	0.1513284	0.4908826	0.7853981	2.7318506
	1.6426868	0.0968162	0.6495722	2.1006870	2.1972561	1.3518267	1.2691774					
176	0.8609673	0.8609669	1.0061760	0.8167117	0.2663186	-0.0852317	-0.0567829	0.3515503	0.1518028	0.4908826	0.7853981	2.7263823
	1.6412020	0.0971799	0.6491739	2.1007214	2.1976500	1.3509893	1.2680550					
177	0.8601707	0.8601702	1.0058346	0.8157759	0.2659989	-0.0861896	-0.0574201	0.3521885	0.1522788	0.4908826	0.7853981	2.7210102
	1.6397104	0.0975445	0.6487747	2.1007557	2.1980486	1.3501520	1.2669287					
178	0.8593761	0.8593757	1.0054913	0.8148412	0.2656792	-0.0871590	-0.0580551	0.3528382	0.1527513	0.4908826	0.7853981	2.7155590
	1.6382246	0.0979081	0.6483765	2.1007910	2.1984425	1.3493157	1.2658062					
179	0.8585822	0.8585818	1.0051479	0.8139064	0.2653595	-0.0881312	-0.0587114	0.3534907	0.1532233	0.4908826	0.7853981	2.7101049
	1.6367397	0.0982721	0.6479777	2.1008253	2.1988354	1.3484755	1.2646847					
180	0.8577896	0.8577892	1.0048046	0.8129718	0.2650398	-0.0891029	-0.0593581	0.3541427	0.1536945	0.4908826	0.7853981	2.7046738
	1.6352558	0.0986366	0.6475785	2.1008606	2.1992283	1.3476372	1.2635641					
181	0.8569936	0.8569933	1.0044603	0.8120368	0.2647201	-0.0900694	-0.0600011	0.3547894	0.1541672	0.4908826	0.7853981	2.6993046
	1.6337681	0.0990011	0.6471790	2.1008944	2.1996241	1.3467949	1.2624397					
182	0.8561984	0.8561980	1.0041151	0.8111022	0.2644004	-0.0910300	-0.0606401	0.3554304	0.1546382	0.4908826	0.7853981	2.6940031
	1.6322784	0.0993654	0.6467798	2.1009302	2.2000217	1.3459597	1.2613153					
183	0.8554051	0.8554047	1.0037689	0.8101680	0.2640836	-0.0920017	-0.0612863	0.3560823	0.1551070	0.4908826	0.7853981	2.6886292
	1.6307955	0.0997297	0.6463805	2.1009655	2.2004147	1.3451214	1.2601948					
184	0.8546105	0.8546101	1.0034218	0.8092339	0.2637609	-0.0929733	-0.0619325	0.3567342	0.1555757	0.4908826	0.7853981	2.6832743
	1.6293087	0.1000938	0.6459814	2.1009998	2.2008085	1.3442812	1.2590714					
185	0.8538138	0.8538135	1.0030746	0.8082995	0.2634412	-0.0939337	-0.0625713	0.3573749	0.1560459	0.4908826	0.7853981	2.6780300
	1.6278191	0.1004584	0.6455815	2.1010351	2.2012062	1.3434420	1.2579460					
186	0.8530213	0.8530210	1.0027266	0.8073658	0.2631215	-0.0949108	-0.0632210	0.3580323	0.1565121	0.4908826	0.7853981	2.6726665
	1.6263361	0.1008228	0.6451821	2.1010704	2.2015982	1.3426027	1.2568264					
187	0.8522260	0.8522257	1.0023775	0.8064317	0.2628018	-0.0958783	-0.0638630	0.3586781	0.1569794	0.4908826	0.7853981	2.6674175
	1.6248474	0.1011873	0.6447822	2.1011057	2.2019939	1.3417616	1.2557020					
188	0.8514314	0.8514311	1.0020285	0.8054981	0.2624821	-0.0968477	-0.0645093	0.3593298	0.1574462	0.4908826	0.7853981	2.6621380
	1.6233616	0.1015519	0.6443823	2.1011410	2.2023888	1.3409214	1.2545795					
189	0.8506355	0.8506352	1.0016794	0.8045643	0.2621624	-0.0978075	-0.0651472	0.3599699	0.1579139	0.4908826	0.7853981	2.6569710
	1.6218719	0.1019173	0.6439816	2.1011763	2.2027874	1.3400822	1.2534562					
190	0.8498375	0.8498372	1.0013285	0.8036305	0.2618427	-0.0987645	-0.0657835	0.3606072	0.1583810	0.4908826	0.7853981	2.6518421
	1.6203795	0.1022820	0.6435813	2.1012125	2.2031870	1.3392401	1.2523270					
191	0.8490458	0.8490454	1.0009766	0.8026974	0.2615229	-0.0997166	-0.0664164	0.3612695	0.1588480	0.4908826	0.7853981	2.6465311
	1.6188974	0.1026465	0.6431814	2.1012478	2.2035770	1.3383989	1.2512083					
192	0.8482506	0.8482503	1.0006247	0.8017638	0.2612032	-0.1007149	-0.0670532	0.3619182	0.1593074	0.4908826	0.7853981	2.6413488
	1.6174107	0.1030116	0.6427807	2.1012831	2.2039728	1.3375578	1.2500849					
193	0.8474548	0.8474545	1.0002717	0.8008304	0.2608836	-0.1016796	-0.0677214	0.3625632	0.1597730	0.4908826	0.7853981	2.6362123
	1.6159229	0.1033775	0.6423791	2.1013184	2.2043705	1.3367176	1.2489605					
194	0.8466598	0.8466595	0.9999208	0.7998971	0.2605639	-0.1026475	-0.0683649	0.3632114	0.1602362	0.4908826	0.7853981	2.6310682
	1.6144352	0.1037429	0.6419780	2.1013546	2.2047672	1.3358765	1.2478371					
195	0.8458628	0.8458624	0.9995672	0.7989636	0.2602441	-0.1036095	-0.0690042	0.3638536	0.1607001	0.4908826	0.7853981	2.6259890
	1.6129536	0.1041084	0.6415767	2.1013899	2.2051659	1.3350334	1.2467168					
196	0.8450685	0.8450681	0.9992138	0.7980310	0.2599244	-0.1045771	-0.0696474	0.3645015	0.1611623	0.4908826	0.7853981	2.6208820
	1.6114578	0.1044739	0.6411753	2.1014261	2.2055616	1.3341923	1.2455883					
197	0.8442728	0.8442724	0.9988595	0.7970976	0.2595048	-0.1055444	-0.0702902	0.3651491	0.1616246	0.4908826	0.7853981	2.6157942
	1.6099682	0.1048403	0.6407731	2.1014624	2.2059593	1.3333512	1.2444539					
198	0.8434753	0.8434749	0.9985058	0.7961645	0.2592850	-0.1065006	-0.0709258	0.3657857	0.1620886	0.4908826	0.7853981	2.6108103
	1.6084766	0.1052068	0.6403705	2.1014977	2.2063608	1.3325090	1.2433367					
199	0.8426818	0.8426815	0.9981511	0.7952313	0.2589653	-0.1074764	-0.0715742	0.3664417	0.1625491	0.4908826	0.7853981	2.6056919
	1.6069918	0.1055735	0.6399677	2.1015339	2.2067566	1.3316679	1.2422152					
200	0.8418863	0.8418860	0.9977964	0.7942991	0.2586457	-0.1084432	-0.0722166	0.3670889	0.1630087	0.4908826	0.7853981	2.6006584
	1.6055040	0.1059393	0.6395659	2.1015701	2.2071533	1.3308249	1.2410917					
201	0.8410897	0.8410893	0.9974371	0.7933662	0.2583259	-0.1094075	-0.0728574	0.3677335	0.1634687	0.4908826	0.7853981	2.5956621
	1.6040134	0.1063054	0.6391636	2.1016064	2.2075520	1.3299804	1.2399654					
202	0.8402924	0.8402920	0.9970831	0.7924332	0.2580062	-0.1103666	-0.0734943	0.3683723	0.1639293	0.4908826	0.7853981	2.5907288
	1.6025219	0.1066721	0.6387605	2.1016426	2.2079535	1.3291388	1.2388371					
203	0.8394971	0.8394968	0.9967219	0.7915014	0.2576865	-0.1113330	-0.0741367	0.3690195	0.1643873	0.4908826	0.7853981	2.5857458
	1.6010342	0.1070388	0.6383576	2.1016788	2.2083511	1.3282957	1.2377148					
204	0.8387039	0.8387036	0.9963633	0.7905688	0.2573668	-0.1123000	-0.0747862	0.3696776	0.1648436	0.4908826	0.7853981	2.5806952
	1.5995502	0.1074052	0.6379548	2.1017151	2.2087450	1.3274517	1.2365902					
205	0.8379056	0.8379053	0.9960029	0.7896369	0.2570471	-0.1132692	-0.0754229	0.3703162	0.1653015	0.4908826	0.7853981	2.5758114
	1.5980568	0.1077716	0.6375518	2.1017523	2.2091465	1.3266077	1.2354653					
206	0.8371100	0.8371096	0.9956427	0.7887049	0.2567274	-0.1142395	-0.0760649	0.3709629	0.1657578	0.4908826	0.7853981	2.5708828
	1.5965672	0.1081381	0.6371489	2.1017885	2.2095491	1.3257637	1.2343415					
207	0.8363132	0.8363128	0.9952819	0.7877727	0.2564077	-0.1152046	-0.0767085	0.3716123	0.1662143	0.4908826	0.7853981	2.5659494
	1.5950785	0.1085051	0.6367457	2.1018248	2.2099526	1.3249187	1.2332183					

208	0.8355176	0.8355173	0.9949206	0.7868409	0.2560880	-0.1161709	-0.0773503	0.3722588	0.1666694	0.4908826	0.7853981	2.5610542
	1.5935898	0.1088721	0.6363416	2.1018620	2.2103415	1.3240747	1.2320919					
209	0.8347223	0.8347219	0.9945574	0.7859090	0.2557582	-0.1171399	-0.0779439	0.3729081	0.1671227	0.4908826	0.7853981	2.5561543
	1.5921011	0.1092386	0.6359384	2.1018982	2.2107341	1.3232288	1.2329675					
210	0.8339257	0.8339254	0.9941949	0.7849773	0.2554485	-0.1181030	-0.0786334	0.3735515	0.1675773	0.4908826	0.7853981	2.5513153
	1.5906105	0.1096059	0.6355343	2.1019354	2.2111387	1.3223839	1.2294422					
211	0.8331299	0.8331295	0.9938316	0.7840458	0.2551288	-0.1190745	-0.0792705	0.3742033	0.1680305	0.4908826	0.7853981	2.5464287
	1.5891218	0.1099730	0.6351303	2.1019726	2.2115364	1.3215380	1.2287178					
212	0.8323336	0.8323332	0.9934680	0.7831141	0.2548091	-0.1200432	-0.0799214	0.3748522	0.1684840	0.4908826	0.7853981	2.5415802
	1.5876331	0.1103406	0.6347256	2.1020088	2.2119350	1.3206930	1.2279925					
213	0.8315372	0.8315369	0.9931013	0.7821825	0.2544894	-0.1210060	-0.0805812	0.3754954	0.1689363	0.4908826	0.7853981	2.5367899
	1.5861425	0.1107079	0.6343213	2.1020460	2.2123356	1.3194471	1.2264571					
214	0.8307372	0.8307369	0.9927344	0.7812508	0.2541697	-0.1219596	-0.0811941	0.3761293	0.1693908	0.4908826	0.7853981	2.5320845
	1.5846462	0.1110754	0.6339161	2.1020832	2.2127399	1.3190012	1.2253370					
215	0.8299432	0.8299428	0.9923724	0.7803190	0.2538500	-0.1229310	-0.0818391	0.3767810	0.1698402	0.4908826	0.7853981	2.5272627
	1.5831604	0.1114433	0.6335116	2.1021204	2.2131376	1.3181553	1.2242146					
216	0.8291466	0.8291463	0.9920061	0.7793884	0.2535303	-0.1239018	-0.0824835	0.3774321	0.1702910	0.4908826	0.7853981	2.5224600
	1.5816708	0.1118114	0.6331063	2.1021576	2.2135363	1.3173084	1.2230892					
217	0.8283483	0.8283480	0.9916384	0.7784572	0.2532105	-0.1248614	-0.0831205	0.3780719	0.1707417	0.4908826	0.7853981	2.5177574
	1.5801764	0.1121789	0.6327015	2.1021948	2.2139387	1.3164606	1.2219610					
218	0.8275513	0.8275509	0.9912704	0.7775263	0.2528908	-0.1258265	-0.0837611	0.3787173	0.1711912	0.4908826	0.7853981	2.5130281
	1.5786858	0.1125467	0.6322963	2.1022320	2.2143394	1.3156137	1.2208347					
219	0.8267552	0.8267548	0.9909021	0.7765955	0.2525712	-0.1267941	-0.0844033	0.3793653	0.1716396	0.4908826	0.7853981	2.5082960
	1.5771961	0.1129149	0.6318907	2.1022701	2.2147388	1.3147669	1.2197104					
220	0.8259565	0.8259562	0.9905326	0.7756646	0.2522514	-0.1277530	-0.0850397	0.3800045	0.1720887	0.4908826	0.7853981	2.5036421
	1.5757017	0.1132829	0.6314849	2.1023073	2.2151423	1.3139191	1.2185812					
221	0.8251607	0.8251604	0.9901632	0.7747337	0.2519317	-0.1287230	-0.0856833	0.3806548	0.1725360	0.4908826	0.7853981	2.4989233
	1.5742130	0.1136512	0.6310791	2.1023455	2.2155459	1.3130713	1.2174568					
222	0.8243650	0.8243646	0.9897925	0.7738031	0.2516120	-0.1296934	-0.0863273	0.3813055	0.1729819	0.4908826	0.7853981	2.4942169
	1.5727243	0.1140199	0.6306728	2.1023827	2.2159495	1.3122234	1.2163324					
223	0.8235655	0.8235652	0.9894216	0.7728720	0.2512923	-0.1306665	-0.0869597	0.3819388	0.1734302	0.4908826	0.7853981	2.4896517
	1.5712280	0.1143885	0.6302663	2.1024208	2.2163558	1.3113747	1.2152023					
224	0.8227684	0.8227684	0.9890506	0.7719416	0.2509726	-0.1316390	-0.0876198	0.3825915	0.1738763	0.4908826	0.7853981	2.4849606
	1.5697384	0.1147575	0.6298595	2.1024580	2.2167654	1.3105268	1.2140770					
225	0.8219715	0.8219712	0.9886780	0.7710111	0.2506528	-0.1325806	-0.0882429	0.3832335	0.1743215	0.4908826	0.7853981	2.4803619
	1.5682459	0.1151261	0.6294531	2.1024961	2.2171778	1.3096781	1.2129459					
226	0.8211746	0.8211742	0.9883034	0.7700812	0.2503332	-0.1335526	-0.0888676	0.3838858	0.1747643	0.4908826	0.7853981	2.4757032
	1.5667562	0.1154938	0.6290474	2.1025343	2.2175965	1.3088274	1.2118244					
227	0.8203770	0.8203766	0.9879293	0.7691510	0.2500135	-0.1345165	-0.0895271	0.3845300	0.1752080	0.4908826	0.7853981	2.4711180
	1.5652637	0.1158627	0.6286404	2.1025724	2.2180180	1.3079777	1.2106972					
228	0.8195771	0.8195767	0.9875546	0.7682208	0.2496938	-0.1354815	-0.0901838	0.3851653	0.1756526	0.4908826	0.7853981	2.4666109
	1.5637674	0.1162314	0.6282335	2.1026106	2.2184533	1.3071280	1.2095671					
229	0.8187819	0.8187816	0.9871791	0.7672906	0.2493740	-0.1364493	-0.0908389	0.3858233	0.1760935	0.4908826	0.7853981	2.4619570
	1.5622797	0.1166004	0.6278264	2.1026487	2.2188910	1.3062773	1.2084435					
230	0.8179811	0.8179807	0.9868038	0.7663604	0.2490543	-0.1374186	-0.0914985	0.3864529	0.1765383	0.4908826	0.7853981	2.4575176
	1.5607815	0.1169700	0.6274184	2.1026869	2.2193291	1.3054276	1.2073116					
231	0.8171855	0.8171852	0.9864277	0.7654303	0.2487346	-0.1383731	-0.0920866	0.3871077	0.1769788	0.4908826	0.7853981	2.4529161
	1.5592928	0.1173394	0.6270108	2.1027250	2.2197678	1.3045769	1.2061772					
232	0.8163883	0.8163880	0.9860499	0.7645009	0.2484149	-0.1393369	-0.0927252	0.3877538	0.1774185	0.4908826	0.7853981	2.4483900
	1.5578022	0.1177084	0.6266034	2.1027632	2.2202066	1.3037262	1.2050410					
233	0.8155887	0.8155883	0.9856712	0.7635712	0.2480952	-0.1402991	-0.0933618	0.3883943	0.1778589	0.4908826	0.7853981	2.4439173
	1.5563049	0.1180774	0.6261958	2.1028023	2.2206456	1.3028736	1.2039039					
234	0.8147899	0.8147895	0.9852920	0.7626415	0.2477755	-0.1412591	-0.0939983	0.3890346	0.1782994	0.4908826	0.7853981	2.4394588
	1.5548115	0.1184469	0.6257877	2.1028404	2.2210850	1.3020229	1.2027627					
235	0.8139919	0.8139915	0.9849145	0.7617120	0.2474558	-0.1422245	-0.0946362	0.3896803	0.1787382	0.4908826	0.7853981	2.4349785
	1.5533190	0.1188164	0.6253791	2.1028795	2.2215244	1.3011713	1.2016154					
236	0.8131929	0.8131925	0.9845327	0.7607822	0.2471361	-0.1431870	-0.0952760	0.3903230	0.1791763	0.4908826	0.7853981	2.4305305
	1.5518236	0.1191861	0.6249711	2.1029186	2.2219638	1.3003174	1.2004633					
237	0.8123941	0.8123939	0.9841530	0.7598526	0.2468163	-0.1441494	-0.0959141	0.3909656	0.1796154	0.4908826	0.7853981	2.4263998
	1.5503292	0.1195564	0.6245626	2.1029568	2.2224032	1.2994601	1.1993071					
238	0.8115956	0.8115953	0.9837722	0.7589239	0.2464967	-0.1451085	-0.0965496	0.3916052	0.1800531	0.4908826	0.7853981	2.4217024
	1.5488368	0.1199267	0.6241526	2.1029951	2.2228435	1.2986145	1.1981489					
239	0.8107928	0.8107925	0.9833896	0.7579943	0.2461770	-0.1460677	-0.0971829	0.3922417	0.1804886	0.4908826	0.7853981	2.4173358
	1.5473509	0.1202966	0.6237419	2.1030333	2.2232838	1.2977610	1.1969878					
240	0.8099916	0.8099915	0.9830035	0.7570645	0.2458572	-0.1470264	-0.0977149	0.3928749	0.1809219	0.4908826	0.7853981	2.4133739
	1.5458164	0.1206664	0.6233339	2.1030715	2.2237241	1.2969034	1.1958187					
241	0.8089913	0.8089910	0.9826252	0.7561352	0.2455375	-0.1479844	-0.0983437	0.3935023	0.1813506	0.4908826	0.7853981	2.4151468
	1.5439634	0.1210370	0.6229140	2.1031097	2.2241644	1.2960438	1.1946406					
242	0.8083856	0.8083851	0.9822432	0.7552060	0.2452178	-0.1489409	-0.0989692	0.3941067	0.1817767	0.4908826	0.7853981	2.4046202
	1.5429295	0.1214083	0.6224940	2.1031532	2.2246048	1.2951824	1.1934532					
243	0.8073862	0.8073859	0.9818576	0.7542767	0.2448981	-0.1498955	-0.0995891	0.3948236	0.1822042	0.4908826	0.7853981	2.4065552
	1.5409632	0.1217800	0.6220743	2.1031919	2.2250452	1.2943178	1.1922647					

244	0.8065810	0.8065807	0.9814742	0.7534175	0.2445784	-0.1498530	-0.0996935	0.3944314	0.1828152	0.4908826	0.7853981	2.4024934
	1.5394535	0.1221404	0.6216931	2.1032419	2.2251606	1.2934942	1.1912031					
245	0.8057826	0.8057823	0.9810895	0.7526186	0.2442587	-0.1508142	-0.1003304	0.3950729	0.1832490	0.4908826	0.7853981	2.3980961
	1.5379601	0.1225119	0.6212822	2.1032810	2.2255669	1.2926416	1.1900749					
246	0.8049819	0.8049816	0.9807031	0.7514896	0.2439390	-0.1517727	-0.1009053	0.3957117	0.1836826	0.4908826	0.7853981	2.3937902
	1.5366618	0.1228830	0.6208714	2.1033211	2.2259741	1.2917862	1.1889439					
247	0.8041809	0.8041806	0.9803150	0.7505610	0.2436193	-0.1527240	-0.1015060	0.3963472	0.1841149	0.4908826	0.7853981	2.3895197
	1.5349636	0.1232535	0.6204612	2.1033602	2.2263813	1.2909307	1.1878119					
248	0.8033770	0.8033767	0.9799278	0.7496321	0.2432995	-0.1536716	-0.1022430	0.3969713	0.1845499	0.4908826	0.7853981	2.3853378
	1.5334597	0.1236249	0.6200500	2.1034002	2.2267933	1.2900753	1.1866760					
249	0.8025771	0.8025768	0.9795402	0.7487031	0.2429798	-0.1546355	-0.1028613	0.3976153	0.1849819	0.4908826	0.7853981	2.3810358
	1.5319633	0.1239966	0.6196384	2.1034403	2.2272046	1.2892199	1.1855459					
250	0.8017744	0.8017742	0.9791521	0.7477744	0.2426601	-0.1555789	-0.1034459	0.3982590	0.1854153	0.4908826	0.7853981	2.3768035
	1.5304623	0.1243685	0.6192265	2.1034803	2.2276115	1.2883654	1.1844120					
251	0.8009757	0.8009753	0.9787632	0.7468457	0.2423404	-0.1565451	-0.1041258	0.3988855	0.1858452	0.4908826	0.7853981	2.3725901
	1.5289669	0.1247405	0.6188145	2.1035204	2.2280169	1.2875090	1.1832629					
252	0.8001698	0.8001694	0.9783736	0.7459169	0.2420207	-0.1574768	-0.1047925	0.3994975	0.1862792	0.4908826	0.7853981	2.3685389
	1.5274591	0.1251129	0.6184020	2.1035604	2.2284346	1.2866535	1.1821342					
253	0.7993685	0.7993681	0.9779842	0.7449881	0.2417010	-0.1584342	-0.1053764	0.4001352	0.1867104	0.4908826	0.7853981	2.3643303
	1.5259600	0.1254858	0.6179889	2.1036005	2.2288437	1.2857981	1.1810122					
254	0.7985658	0.7985654	0.9775930	0.7440594	0.2413813	-0.1593887	-0.1060083	0.4007699	0.1871407	0.4908826	0.7853981	2.3601532
	1.5244598	0.1258578	0.6175765	2.1036406	2.2292538	1.2849407	1.1798782					
255	0.7977626	0.7977622	0.9772018	0.7431309	0.2410616	-0.1603312	-0.1066321	0.4013928	0.1875713	0.4908826	0.7853981	2.3560677
	1.5229559	0.1262306	0.6171634	2.1036816	2.2296677	1.2840843	1.1787436					
256	0.7969616	0.7969612	0.9768096	0.7422035	0.2407418	-0.1612480	-0.1072656	0.4020049	0.1879995	0.4908826	0.7853981	2.3519001
	1.5214577	0.1266035	0.6167501	2.1037216	2.2300768	1.2832279	1.1776114					
257	0.7961614	0.7961611	0.9764176	0.7412736	0.2404221	-0.1622503	-0.1079022	0.4026725	0.1884275	0.4908826	0.7853981	2.3477097
	1.5199594	0.1269773	0.6163360	2.1037626	2.2304850	1.2823706	1.1764803					
258	0.7953585	0.7953582	0.9760240	0.7403455	0.2401025	-0.1632037	-0.1085330	0.4033061	0.1888555	0.4908826	0.7853981	2.3435898
	1.5184593	0.1273498	0.6159226	2.1038027	2.2308960	1.2815132	1.1753464					
259	0.7945548	0.7945545	0.9756304	0.7394171	0.2397828	-0.1641487	-0.1091584	0.4039315	0.1892841	0.4908826	0.7853981	2.3395348
	1.5169544	0.1277231	0.6155086	2.1038437	2.2313099	1.2806549	1.1742105					
260	0.7937537	0.7937533	0.9752353	0.7384887	0.2394630	-0.1651077	-0.1097928	0.4045707	0.1897096	0.4908826	0.7853981	2.3354034
	1.5154562	0.1280963	0.6150947	2.1038847	2.2317190	1.2797966	1.1730785					
261	0.7929500	0.7929497	0.9748404	0.7375603	0.2391433	-0.1660495	-0.1104159	0.4051929	0.1901370	0.4908826	0.7853981	2.3313942
	1.5139513	0.1284703	0.6146798	2.1039257	2.2321368	1.2789392	1.1719427					
262	0.7921466	0.7921462	0.9744446	0.7366322	0.2388236	-0.1669995	-0.1110443	0.4058231	0.1905633	0.4908826	0.7853981	2.3273439
	1.5124483	0.1288441	0.6142650	2.1039667	2.2325478	1.2780800	1.1708078					
263	0.7913452	0.7913448	0.9740474	0.7357045	0.2385039	-0.1679606	-0.1116799	0.4064645	0.1909867	0.4908826	0.7853981	2.3232346
	1.5109501	0.1292176	0.6138505	2.1040077	2.2329569	1.2772217	1.1696758					
264	0.7905418	0.7905415	0.9736486	0.7347769	0.2381842	-0.1689104	-0.1123082	0.4070947	0.1914100	0.4908826	0.7853981	2.3192091
	1.5094461	0.1295903	0.6134367	2.1040487	2.2333669	1.2763605	1.1685400					
265	0.7897382	0.7897378	0.9732500	0.7338483	0.2378645	-0.1698574	-0.1129365	0.4077219	0.1918337	0.4908826	0.7853981	2.3152142
	1.5079432	0.1299639	0.6130218	2.1040897	2.2337826	1.2754913	1.1674051					
266	0.7889336	0.7889333	0.9728519	0.7329207	0.2375448	-0.1708041	-0.1135605	0.4083489	0.1922585	0.4908826	0.7853981	2.3112316
	1.5064383	0.1303387	0.6126057	2.1041307	2.2341976	1.2746220	1.1662683					
267	0.7881319	0.7881315	0.9724529	0.7319928	0.2372251	-0.1717619	-0.1141938	0.4089869	0.1926806	0.4908826	0.7853981	2.3071909
	1.5049381	0.1307136	0.6121897	2.1041727	2.2346087	1.2737518	1.1651359					
268	0.7873297	0.7873294	0.9720523	0.7310650	0.2369053	-0.1727219	-0.1148264	0.4096273	0.1931010	0.4908826	0.7853981	2.3031483
	1.5034380	0.1310872	0.6117744	2.1042137	2.2350187	1.2728806	1.1640024					
269	0.7865227	0.7865224	0.9716512	0.7301371	0.2365856	-0.1736542	-0.1154648	0.4102398	0.1935248	0.4908826	0.7853981	2.2992926
	1.5019274	0.1314622	0.6113583	2.1042557	2.2354343	1.2720094	1.1628618					
270	0.7857225	0.7857221	0.9712496	0.7292100	0.2362660	-0.1746197	-0.1160830	0.4108657	0.1939431	0.4908826	0.7853981	2.2952375
	1.5004311	0.1318363	0.6109421	2.1042967	2.2358465	1.2711382	1.1617108					
271	0.7849185	0.7849182	0.9708466	0.7282822	0.2359262	-0.1755739	-0.1167136	0.4115201	0.1943627	0.4908826	0.7853981	2.2912664
	1.4989271	0.1322105	0.6105261	2.1043386	2.2362595	1.2702362	1.1605549					
272	0.7841131	0.7841128	0.9704440	0.7273544	0.2356065	-0.1765106	-0.1173360	0.4121431	0.1947837	0.4908826	0.7853981	2.2873783
	1.4974203	0.1325859	0.6101099	2.1043806	2.2366762	1.2693750	1.1593972					
273	0.7833116	0.7833112	0.9700409	0.7264269	0.2353068	-0.1774733	-0.1179689	0.4127601	0.1952016	0.4908826	0.7853981	2.2834139
	1.4959192	0.1329613	0.6096920	2.1044226	2.2370882	1.2684629	1.1582242					
274	0.7825063	0.7825060	0.9696360	0.7254994	0.2349871	-0.1784484	-0.1185943	0.4133655	0.1956202	0.4908826	0.7853981	2.2795343
	1.4944134	0.1333362	0.6092747	2.1044645	2.2375050	1.2675507	1.1571465					
275	0.7817097	0.7817093	0.9692315	0.7245717	0.2346674	-0.1794307	-0.1192158	0.4140280	0.1960402	0.4908826	0.7853981	2.2756824
	1.4929047	0.1337117	0.6088570	2.1045065	2.2379227	1.2666477	1.1560469					
276	0.7809063	0.7809059	0.9688244	0.7236446	0.2343476	-0.1803942	-0.1198258	0.4146618	0.1964554	0.4908826	0.7853981	2.2717714
	1.4914017	0.1340866	0.6084400	2.1045485	2.2383356	1.2657436	1.1549120					
277	0.7800916	0.7800913	0.9684144	0.7227172	0.2340260	-0.1813614	-0.1204215	0.4152494	0.1968724	0.4908826	0.7853981	2.2679100
	1.4899958	0.1344621	0.6080223	2.1045914	2.2387514	1.2648386	1.1537752					
278	0.7792867	0.7792863	0.9680117	0.7217896	0.2337083	-0.1823417	-0.1210492	0.4159203	0.1972893	0.4908826	0.7853981	2.2640429
	1.4883929	0.1348382	0.6076034	2.1046333	2.2391672	1.2639275	1.1526375					
279	0.7784821	0.7784817	0.9676051	0.7208623	0.2333885	-0.1833349	-0.1216766	0.4165504	0.1977056	0.4908826	0.7853981	2.2601862
	1.4868851	0.1352145	0.6071851	2.1046762	2.2395830	1.2630135	1.1515007					

280	0.7776779	0.7776775	0.9671956	0.7199351	0.2330688-0.1841145-0.1223558			0.4171833	0.1981190	0.4908826	0.7853981	2.2563257
	1.4853811	0.1355902	0.6067669	2.1047182	2.2999969	1.2625685	1.1503649					
281	0.7768725	0.7768721	0.9667862	0.7190083	0.2327491-0.1850582-0.1229769			0.4178073	0.1985332	0.4908826	0.7853981	2.2525301
	1.4838734	0.1359662	0.6063483	2.1047611	2.2404146	1.2617044	1.1492262					
282	0.7760674	0.7760670	0.9663751	0.7180812	0.2324294-0.1860077-0.1236058			0.4184371	0.1989457	0.4908826	0.7853981	2.2487097
	1.4823675	0.1363419	0.6059299	2.1048040	2.2408304	1.2608385	1.1480394					
283	0.7752620	0.7752616	0.9659635	0.7171545	0.2321037-0.1869625-0.1242362			0.4190722	0.1993577	0.4908826	0.7853981	2.2448683
	1.4808626	0.1367174	0.6055115	2.1048469	2.2412463	1.2599716	1.1469517					
284	0.7744583	0.7744580	0.9655525	0.7162272	0.2317900-0.1879145-0.1248645			0.4197045	0.1997694	0.4908826	0.7853981	2.2410555
	1.4793577	0.1370942	0.6050918	2.1048889	2.2416601	1.2591066	1.1458158					
285	0.7736511	0.7736507	0.9651439	0.7153003	0.2314703-0.1888549-0.1254853			0.4203252	0.2001828	0.4908826	0.7853981	2.2373228
	1.4778471	0.1374708	0.6046722	2.1049328	2.2420797	1.2582397	1.1446753					
286	0.7728446	0.7728443	0.9647291	0.7143731	0.2311506-0.1897978-0.1261075			0.4209483	0.2005955	0.4908826	0.7853981	2.2335854
	1.4763384	0.1378485	0.6042514	2.1049757	2.2424994	1.2573748	1.1435350					
287	0.7720404	0.7720400	0.9643167	0.7134459	0.2308308-0.1907548-0.1267371			0.4215857	0.2010061	0.4908826	0.7853981	2.2297745
	1.4748444	0.1382260	0.6038308	2.1050186	2.2429192	1.2565088	1.1423996					
288	0.7712349	0.7712346	0.9639029	0.7125187	0.2305111-0.1917302-0.1273628			0.4222113	0.2014162	0.4908826	0.7853981	2.2260427
	1.4733267	0.1386034	0.6034101	2.1050615	2.2433329	1.2556419	1.1412511					
289	0.7704270	0.7704266	0.9634877	0.7115920	0.2301914-0.1926398-0.1279827			0.4228312	0.2018266	0.4908826	0.7853981	2.2223568
	1.4718151	0.1389805	0.6029896	2.1051054	2.2437534	1.2547741	1.1401196					
290	0.7696228	0.7696224	0.9630731	0.7106652	0.2298717-0.1935990-0.1286155			0.4234437	0.2022349	0.4908826	0.7853981	2.2185640
	1.4703112	0.1393582	0.6025686	2.1051493	2.2441683	1.2539072	1.1389837					
291	0.7688152	0.7688149	0.9626562	0.7097384	0.2295520-0.1945410-0.1292370			0.4240931	0.2026434	0.4908826	0.7853981	2.2148838
	1.4688005	0.1397355	0.6021476	2.1051922	2.2445879	1.2530384	1.1378431					
292	0.7680085	0.7680081	0.9622405	0.7088115	0.2292323-0.1954830-0.1298583			0.4247153	0.2030525	0.4908826	0.7853981	2.2112131
	1.4672899	0.1401138	0.6017256	2.1052361	2.2450085	1.2521706	1.1367025					
293	0.7672037	0.7672034	0.9618227	0.7078847	0.2289126-0.1964273-0.1304839			0.4253399	0.2034602	0.4908826	0.7853981	2.2075405
	1.4657803	0.1404915	0.6013041	2.1052799	2.2454281	1.2513018	1.1355619					
294	0.7663954	0.7663950	0.9614051	0.7069581	0.2285929-0.1973773-0.1311074			0.4259701	0.2038665	0.4908826	0.7853981	2.2038441
	1.4642735	0.1408699	0.6008823	2.1053238	2.2458467	1.2504339	1.1344242					
295	0.7655873	0.7655870	0.9609858	0.7060313	0.2282732-0.1983215-0.1317300			0.4265947	0.2042729	0.4908826	0.7853981	2.2001915
	1.4627609	0.1412479	0.6004601	2.1053677	2.2462673	1.2495632	1.1332817					
296	0.7647797	0.7647793	0.9605665	0.7051051	0.2279535-0.1992625-0.1323504			0.4272160	0.2046790	0.4908826	0.7853981	2.1965066
	1.4612503	0.1416264	0.6000375	2.1054115	2.2466868	1.2486944	1.1321411					
297	0.7639769	0.7639765	0.9601456	0.7041783	0.2276336-0.2002287-0.1329673			0.4278625	0.2050804	0.4908826	0.7853981	2.1928062
	1.4597492	0.1420046	0.5996153	2.1054556	2.2471008	1.2478237	1.1310072					
298	0.7631657	0.7631654	0.9592757	0.7032515	0.2273141-0.2011955-0.1335963			0.4284696	0.2054885	0.4908826	0.7853981	2.1892853
	1.4582310	0.1423840	0.5991915	2.1055002	2.2475290	1.2469549	1.1298609					
299	0.7623600	0.7623597	0.9588033	0.7023250	0.2269943-0.2021160-0.1342273			0.4291043	0.2058903	0.4908826	0.7853981	2.1856127
	1.4567237	0.1427625	0.5987684	2.1055441	2.2479458	1.2460833	1.1287222					
300	0.7615531	0.7615528	0.9584814	0.7013987	0.2266746-0.2030587-0.1348525			0.4297333	0.2062934	0.4908826	0.7853981	2.1819839
	1.4552145	0.1431417	0.5983451	2.1055889	2.2483554	1.2452129	1.1275826					
301	0.7607450	0.7607446	0.9580576	0.7004721	0.2263549-0.2040017-0.1354738			0.4303566	0.2066956	0.4908826	0.7853981	2.1783981
	1.4537029	0.1435205	0.5979219	2.1056328	2.2487649	1.2443409	1.1264410					
302	0.7599367	0.7599363	0.9575835	0.6995460	0.2260352-0.2049387-0.1360911			0.4309739	0.2070974	0.4908826	0.7853981	2.1748571
	1.4521896	0.1438996	0.5974981	2.1056776	2.2492104	1.2434702	1.1252985					
303	0.7591296	0.7591292	0.9570085	0.6986194	0.2257155-0.2058924-0.1367194			0.4316079	0.2074978	0.4908826	0.7853981	2.1712284
	1.4506788	0.1442789	0.5970742	2.1057224	2.2496296	1.2425966	1.1241579					
304	0.7583218	0.7583214	0.9571837	0.6976933	0.2253958-0.2068373-0.1373417			0.4322331	0.2078986	0.4908826	0.7853981	2.1676607
	1.4491692	0.1446580	0.5966495	2.1057673	2.2500505	1.2417250	1.1230173					
305	0.7575134	0.7575130	0.9567578	0.6967663	0.2250761-0.2077852-0.1379661			0.4328613	0.2082991	0.4908826	0.7853981	2.1640854
	1.4476557	0.1450387	0.5962246	2.1058121	2.2504721	1.2408514	1.1218748					
306	0.7567055	0.7567051	0.9563320	0.6958400	0.2247564-0.2087300-0.1385884			0.4334864	0.2086990	0.4908826	0.7853981	2.1605377
	1.4461451	0.1454193	0.5957990	2.1058569	2.2508943	1.2399757	1.1207333					
307	0.7558965	0.7558962	0.9552045	0.6949136	0.2244366-0.2096743-0.1392150			0.4341109	0.2090982	0.4908826	0.7853981	2.1570034
	1.4446325	0.1457990	0.5953742	2.1059017	2.2513161	1.2391052	1.1195908					
308	0.7550868	0.7550865	0.9553762	0.6939869	0.2241165-0.2106186-0.1398396			0.4347260	0.2094970	0.4908826	0.7853981	2.1535387
	1.4431162	0.1461797	0.5949484	2.1059465	2.2517429	1.2382317	1.1184464					
309	0.7542777	0.7542773	0.9553679	0.6930602	0.2237973-0.2115545-0.1404603			0.4353518	0.2098954	0.4908826	0.7853981	2.1500072
	1.4416037	0.1465600	0.5945228	2.1059913	2.2521648	1.2373541	1.1173018					
310	0.7534685	0.7534682	0.9546193	0.6921347	0.2234775-0.2124935-0.1410774			0.4359730	0.2102937	0.4908826	0.7853981	2.1465187
	1.4400892	0.1469413	0.5940961	2.1060361	2.2525862	1.2364765	1.1161534					
311	0.7526603	0.7526600	0.9541993	0.6912084	0.2231578-0.2134334-0.1416919			0.4365857	0.2106876	0.4908826	0.7853981	2.1429319
	1.4385824	0.1473227	0.5936697	2.1060810	2.2530079	1.2355988	1.1150027					
312	0.7518508	0.7518504	0.9537582	0.6902825	0.2228381-0.2143693-0.1423111			0.4372234	0.2110857	0.4908826	0.7853981	2.1395273
	1.4370632	0.1477028	0.5932434	2.1061257	2.2534281	1.2347195	1.1138499					
313	0.7510425	0.7510422	0.9533203	0.6893558	0.2225184-0.2153042-0.1429285			0.4378526	0.2114833	0.4908826	0.7853981	2.1360216
	1.4355507	0.1480840	0.5928169	2.1061705	2.2538476	1.2338381	1.1127227					
314	0.7502311	0.7502308	0.9528824	0.6884286	0.2221987-0.2162380-0.1435444			0.4384647	0.2118766	0.4908826	0.7853981	2.1326199
	1.4340324	0.1484653	0.5924573	2.1062152	2.2542658	1.2329556	1.1115955					
315	0.7494242	0.7494238	0.9520447	0.6875033	0.2218790-0.2171713-0.1441594			0.4390883	0.2122694	0.4908826	0.7853981	2.1291218
	1.4325218	0.1488467	0.5920053	2.1062600	2.2546823	1.2320722	1.1104663					

316	0.7486127	0.7486123	0.9520282	0.6865776	0.2215593	-0.2181541	-0.1447936	0.4397134	0.2126615			
	1.4310045	0.1492288	0.5915340	2.1063128	2.2551346	1.2312307	1.1092797					
317	0.7478040	0.7478036	0.9515939	0.6856513	0.2212396	-0.2191079	-0.1454179	0.4403474	0.2130569	0.4908826	0.7853981	2.1222172
	1.4294920	0.1496106	0.5911061	2.1063585	2.2555761	1.2303534	1.1081572					
318	0.7469941	0.7469938	0.9511585	0.6847255	0.2209198	-0.2200471	-0.1460356	0.4409670	0.2134489	0.4908826	0.7853981	2.1188126
	1.4279757	0.1499925	0.5906780	2.1064053	2.2559824	1.2294760	1.1070127					
319	0.7461839	0.7461835	0.9507224	0.6837990	0.2206001	-0.2209920	-0.1466569	0.4415921	0.2138407	0.4908826	0.7853981	2.1153851
	1.4264612	0.1503749	0.5902492	2.1064510	2.2563988	1.2285986	1.1058683					
320	0.7453736	0.7453732	0.9502863	0.6828728	0.2202804	-0.2219337	-0.1472760	0.4422141	0.2142321	0.4908826	0.7853981	2.1119843
	1.4249449	0.1507572	0.5898234	2.1064978	2.2568331	1.2277203	1.1047239					
321	0.7445619	0.7445615	0.9498492	0.6819467	0.2199607	-0.2228725	-0.1478932	0.4428332	0.2146241	0.4908826	0.7853981	2.1086082
	1.4234266	0.1511399	0.5893912	2.1065445	2.2572803	1.2268419	1.1035767					
322	0.7437505	0.7437502	0.9494119	0.6810207	0.2196419	-0.2238052	-0.1485063	0.4434463	0.2150154	0.4908826	0.7853981	2.1052742
	1.4219084	0.1515227	0.5889617	2.1065912	2.2576895	1.2259636	1.1024303					
323	0.7429397	0.7429394	0.9489741	0.6800945	0.2193213	-0.2247464	-0.1491249	0.4440677	0.2154058	0.4908826	0.7853981	2.1019020
	1.4203911	0.1519061	0.5885316	2.1066383	2.2581187	1.2250853	1.1012853					
324	0.7421296	0.7421292	0.9485346	0.6791683	0.2190016	-0.2256929	-0.1497468	0.4446945	0.2157941	0.4908826	0.7853981	2.0985107
	1.4188757	0.1522892	0.5881017	2.1066847	2.2585421	1.2242060	1.1001406					
325	0.7413184	0.7413180	0.9480961	0.6782420	0.2186819	-0.2266337	-0.1503651	0.4453156	0.2161842	0.4908826	0.7853981	2.0951586
	1.4173584	0.1526737	0.5876702	2.1067314	2.2589712	1.2233276	1.0989943					
326	0.7405064	0.7405060	0.9476558	0.6773157	0.2183622	-0.2275712	-0.1509809	0.4459333	0.2165731	0.4908826	0.7853981	2.0918341
	1.4158392	0.1530574	0.5872394	2.1067781	2.2593994	1.2224474	1.0978470					
327	0.7396957	0.7396954	0.9467151	0.6763895	0.2180424	-0.2285143	-0.1516005	0.4465567	0.2169607	0.4908826	0.7853981	2.0884876
	1.4143219	0.1534416	0.5868081	2.1068250	2.2598276	1.2215681	1.0967015					
328	0.7388822	0.7388818	0.9467747	0.6754635	0.2177226	-0.2294430	-0.1522105	0.4471658	0.2173504	0.4908826	0.7853981	2.0852261
	1.4127998	0.1538261	0.5863762	2.1068735	2.2602596	1.2206889	1.0955524					
329	0.7380713	0.7380709	0.9463332	0.6745370	0.2174031	-0.2303912	-0.1528333	0.4477943	0.2177374	0.4908826	0.7853981	2.0818691
	1.4112835	0.1542109	0.5859439	2.1069202	2.2606869	1.2198076	1.0944071					
330	0.7372620	0.7372616	0.9458896	0.6736112	0.2170833	-0.2313416	-0.1534573	0.4484249	0.2181212	0.4908826	0.7853981	2.0785084
	1.4097700	0.1545953	0.5855122	2.1069679	2.2611113	1.2189264	1.0932636					
331	0.7364480	0.7364477	0.9454463	0.6726848	0.2167636	-0.2322726	-0.1540886	0.4490362	0.2185085	0.4908826	0.7853981	2.0752611
	1.4082479	0.1549802	0.5850796	2.1070156	2.2615442	1.2180452	1.0921135					
332	0.7356364	0.7356361	0.9450012	0.6717585	0.2164439	-0.2332200	-0.1546906	0.4496639	0.2188926	0.4908826	0.7853981	2.0719337
	1.4067287	0.1553649	0.5846472	2.1070633	2.2619715	1.2171621	1.0909672					
333	0.7348238	0.7348234	0.9445559	0.6708327	0.2161242	-0.2341506	-0.1553115	0.4502748	0.2192769	0.4908826	0.7853981	2.0687046
	1.4052076	0.1557497	0.5842146	2.1071110	2.2624035	1.2162800	1.0898190					
334	0.7340115	0.7340112	0.9441003	0.6699067	0.2158045	-0.2350948	-0.1559212	0.4508994	0.2196599	0.4908826	0.7853981	2.0654116
	1.4036884	0.1561348	0.5837815	2.1071587	2.2628317	1.2153969	1.0886717					
335	0.7331976	0.7331973	0.9436628	0.6689805	0.2154848	-0.2360247	-0.1565314	0.4515095	0.2200440	0.4908826	0.7853981	2.0622034
	1.4021654	0.1565205	0.5833478	2.1072073	2.2632656	1.2145147	1.0875215					
336	0.7323857	0.7323853	0.9432161	0.6680545	0.2151651	-0.2369657	-0.1571388	0.4521307	0.2204267	0.4908826	0.7853981	2.0589437
	1.4006472	0.1569067	0.5829135	2.1072550	2.2636957	1.2136326	1.0863743					
337	0.7315729	0.7315725	0.9427694	0.6671281	0.2148454	-0.2379093	-0.1577479	0.4527546	0.2208090	0.4908826	0.7853981	2.0556793
	1.3991261	0.1572926	0.5824793	2.1073036	2.2641258	1.2127476	1.0852261					
338	0.7307597	0.7307593	0.9423183	0.6662021	0.2145256	-0.2388546	-0.1583647	0.4533753	0.2211892	0.4908826	0.7853981	2.0524406
	1.3976049	0.1576781	0.5820454	2.1073523	2.2645559	1.2118626	1.0840778					
339	0.7299467	0.7299464	0.9418682	0.6652761	0.2142059	-0.2398075	-0.1589833	0.4539934	0.2215693	0.4908826	0.7853981	2.0492220
	1.3960838	0.1580639	0.5816111	2.1074009	2.2649870	1.2109776	1.0829287					
340	0.7291317	0.7291313	0.9414182	0.6643499	0.2138862	-0.2407617	-0.1596126	0.4546079	0.2219509	0.4908826	0.7853981	2.0460310
	1.3945599	0.1584505	0.5811759	2.1074486	2.2654200	1.2100925	1.0817776					
341	0.7283193	0.7283190	0.9409670	0.6634240	0.2135665	-0.2417173	-0.1602387	0.4552279	0.2223294	0.4908826	0.7853981	2.0428200
	1.3930387	0.1588370	0.5807407	2.1074982	2.2658520	1.2092075	1.0806303					
342	0.7273388	0.7273384	0.9405147	0.6624978	0.2132468	-0.2426728	-0.1608645	0.4558496	0.2227080	0.4908826	0.7853981	2.0396392
	1.3912048	0.1592238	0.5803050	2.1075463	2.2662820	1.2083216	1.0792765					
343	0.7266836	0.7266833	0.9400633	0.6615717	0.2129271	-0.2436314	-0.1614951	0.4564685	0.2230928	0.4908826	0.7853981	2.0364240
	1.3899794	0.1596109	0.5798685	2.1075964	2.2667094	1.2074366	1.0781195					
344	0.7257103	0.7257097	0.9396095	0.6606458	0.2126074	-0.2445905	-0.1621291	0.4570929	0.2234761	0.4908826	0.7853981	2.0332972
	1.3881569	0.1599980	0.5794327	2.1076546	2.2671498	1.2065496	1.0769434					
345	0.7250530	0.7250526	0.9391575	0.6597189	0.2122877	-0.2455554	-0.1627568	0.4576530	0.2238610	0.4908826	0.7853981	2.0303364
	1.3869286	0.1603864	0.5789946	2.1076946	2.2676010	1.2056634	1.0760155					
346	0.7240782	0.7240779	0.9387044	0.6587924	0.2119679	-0.2465213	-0.1633785	0.4582193	0.2242361	0.4908826	0.7853981	2.0310221
	1.3851042	0.1607651	0.5785567	2.1077538	2.2680344	1.2047777	1.0748684					
347	0.7232592	0.7232589	0.9382510	0.6578659	0.2116483	-0.2474898	-0.1639775	0.4587834	0.2246170	0.4908826	0.7853981	2.0279799
	1.3835776	0.1611536	0.5781186	2.1078033	2.2684706	1.2038918	1.0734415					
348	0.7224448	0.7224445	0.9377965	0.6569399	0.2113286	-0.2484606	-0.1645704	0.4593292	0.2250037	0.4908826	0.7853981	2.0248356
	1.3820486	0.1615427	0.5776801	2.1078529	2.2689127	1.2030058	1.0721905					
349	0.7216286	0.7216282	0.9373404	0.6560133	0.2110088	-0.2494331	-0.1651613	0.4598419	0.2253904	0.4908826	0.7853981	2.0217142
	1.3805208	0.1619312	0.5772418	2.1079025	2.2693595	1.2021170	1.0711775					
350	0.7208126	0.7208123	0.9368839	0.6550871	0.2106891	-0.2504063	-0.1657539	0.4599574	0.2256464	0.4908826	0.7853981	2.0185671
	1.3789959	0.1623204	0.5768028	2.1079521	2.2700453	1.2012291	1.0700254					
351	0.7199957	0.7199953	0.9364267	0.6541605	0.2103694	-0.2513796	-0.1663476	0.4605671	0.2262225	0.4908826	0.7853981	2.0154972
	1.3774681	0.1627094	0.5763638	2.1080017	2.2704830	1.2003403	1.0688715					

352	0.7191796	0.7191793	0.9359683	0.6532341	0.2100497	-0.2511206	-0.1664408	0.4611763	0.2265968	0.4908826	0.7853981	2.0124168
	1.3759413	0.1630990	0.5759242	2.1080523	2.2709217	1.1994524	1.0677185					
353	0.7183627	0.7183623	0.9355096	0.6523075	0.2097305	-0.2520584	-0.1670411	0.4617884	0.2269714	0.4908826	0.7853981	2.0093298
	1.3744125	0.1634887	0.5754843	2.1081028	2.2713604	1.1985626	1.0665446					
354	0.7175469	0.7175466	0.9350502	0.6513812	0.2094103	-0.2529896	-0.1676536	0.4623999	0.2273445	0.4908826	0.7853981	2.0062532
	1.3728857	0.1638784	0.5750443	2.1081524	2.2717981	1.1976738	1.0654116					
355	0.7167299	0.7167295	0.9345909	0.6504546	0.2090906	-0.2539206	-0.1682650	0.4630111	0.2277187	0.4908826	0.7853981	2.0031853
	1.3713579	0.1642688	0.5746035	2.1082029	2.2722368	1.1967840	1.0642576					
356	0.7159122	0.7159119	0.9341301	0.6495281	0.2087709	-0.2548513	-0.1688691	0.4636222	0.2280917	0.4908826	0.7853981	2.0001268
	1.3698282	0.1646591	0.5741625	2.1082535	2.2726765	1.1958933	1.0631027					
357	0.7150961	0.7150958	0.9336690	0.6486018	0.2084512	-0.2557821	-0.1694702	0.4642332	0.2284635	0.4908826	0.7853981	1.9970751
	1.3683014	0.1650500	0.5737211	2.1083040	2.2731152	1.1950045	1.0619497					
358	0.7142783	0.7142780	0.9332067	0.6476749	0.2081314	-0.2567124	-0.1700675	0.4648439	0.2288353	0.4908826	0.7853981	1.9940329
	1.3667717	0.1654402	0.5732793	2.1083555	2.2735558	1.1941128	1.0607948					
359	0.7134583	0.7134580	0.9327450	0.6467486	0.2078117	-0.2576289	-0.1706866	0.4654406	0.2292091	0.4908826	0.7853981	1.9910660
	1.3652372	0.1658323	0.5728369	2.1084061	2.2740002	1.1932220	1.0596361					
360	0.7126409	0.7126406	0.9322812	0.6458218	0.2074921	-0.2585585	-0.1712956	0.4660506	0.2295792	0.4908826	0.7853981	1.9880419
	1.3637075	0.1662238	0.5723944	2.1084576	2.2744438	1.1923304	1.0584812					
361	0.7118239	0.7118236	0.9318177	0.6448953	0.2071723	-0.2594938	-0.1719004	0.4666661	0.2299492	0.4908826	0.7853981	1.9849977
	1.3621798	0.1666153	0.5719518	2.1085081	2.2748804	1.1914387	1.0573273					
362	0.7110066	0.7110063	0.9313534	0.6439683	0.2068526	-0.2604260	-0.1725150	0.4672787	0.2303189	0.4908826	0.7853981	1.9819756
	1.3606501	0.1670073	0.5715079	2.1085596	2.2753210	1.1905470	1.0561724					
363	0.7101856	0.7101853	0.9308884	0.6430415	0.2065329	-0.2613613	-0.1731344	0.4678742	0.2306902	0.4908826	0.7853981	1.9790430
	1.3591137	0.1674001	0.5710642	2.1086111	2.2757673	1.1896544	1.0550127					
364	0.7093683	0.7093680	0.9304217	0.6421150	0.2062132	-0.2622755	-0.1737251	0.4684887	0.2310575	0.4908826	0.7853981	1.9760256
	1.3575853	0.1677923	0.5706205	2.1086626	2.2762079	1.1887617	1.0538578					
365	0.7085493	0.7085490	0.9299554	0.6411880	0.2058935	-0.2632016	-0.1743105	0.4690951	0.2314263	0.4908826	0.7853981	1.9730558
	1.3560524	0.1681854	0.5701754	2.1087141	2.2766514	1.1878691	1.0527010					
366	0.7077317	0.7077314	0.9294873	0.6402612	0.2055738	-0.2641379	-0.1749424	0.4697117	0.2317926	0.4908826	0.7853981	1.9700422
	1.3545237	0.1685781	0.5697314	2.1087656	2.2770910	1.1869745	1.0515461					
367	0.7069124	0.7069121	0.9290191	0.6393344	0.2052541	-0.2650607	-0.1755455	0.4703148	0.2321597	0.4908826	0.7853981	1.9671021
	1.3529902	0.1689712	0.5692863	2.1088181	2.2775364	1.1860809	1.0503883					
368	0.7060923	0.7060920	0.9285501	0.6384076	0.2049344	-0.2659885	-0.1761516	0.4709228	0.2325267	0.4908826	0.7853981	1.9641447
	1.3514576	0.1693645	0.5688410	2.1088696	2.2779799	1.1851864	1.0492306					
369	0.7052726	0.7052723	0.9280813	0.6374809	0.2046146	-0.2669079	-0.1767523	0.4715226	0.2328935	0.4908826	0.7853981	1.9612341
	1.3499222	0.1697584	0.5683949	2.1089220	2.2784262	1.1842918	1.0480719					
370	0.7044532	0.7044529	0.9276108	0.6365536	0.2042949	-0.2678407	-0.1773515	0.4721456	0.2332587	0.4908826	0.7853981	1.9582672
	1.3483906	0.1701525	0.5679485	2.1089745	2.2788687	1.1833963	1.0469151					
371	0.7036341	0.7036338	0.9271398	0.6356270	0.2039752	-0.2687737	-0.1779470	0.4727489	0.2336220	0.4908826	0.7853981	1.9553061
	1.3468580	0.1705469	0.5675027	2.1090269	2.2793112	1.1824999	1.0457582					
372	0.7028134	0.7028131	0.9266670	0.6347003	0.2036555	-0.2696921	-0.1785706	0.4733475	0.2339867	0.4908826	0.7853981	1.9524212
	1.3453226	0.1709401	0.5670559	2.1090794	2.2797585	1.1816044	1.0445986					
373	0.7019944	0.7019941	0.9261931	0.6337733	0.2033358	-0.2706293	-0.1791825	0.4739651	0.2343484	0.4908826	0.7853981	1.9494534
	1.3437910	0.1713341	0.5666091	2.1091318	2.2802000	1.1807070	1.0434418					
374	0.7011732	0.7011729	0.9257186	0.6328467	0.2030161	-0.2715421	-0.1797765	0.4745582	0.2347107	0.4908826	0.7853981	1.9466095
	1.3422537	0.1717281	0.5661625	2.1091842	2.2806492	1.1798096	1.0422812					
375	0.7003526	0.7003523	0.9252451	0.6319196	0.2026964	-0.2724735	-0.1803663	0.4751699	0.2350737	0.4908826	0.7853981	1.9436836
	1.3407192	0.1721234	0.5657143	2.1092377	2.2810936	1.1789122	1.0411224					
376	0.6995299	0.6995296	0.9247692	0.6309926	0.2023767	-0.2733984	-0.1809484	0.4757650	0.2354358	0.4908826	0.7853981	1.9408426
	1.3391790	0.1725178	0.5652667	2.1092911	2.2815428	1.1780138	1.0399599					
377	0.6987107	0.6987104	0.9242930	0.6300656	0.2020569	-0.2743224	-0.1815229	0.4763793	0.2357954	0.4908826	0.7853981	1.9379187
	1.3376465	0.1729131	0.5648182	2.1093445	2.2819972	1.1771154	1.0388031					
378	0.6978911	0.6978908	0.9238173	0.6291385	0.2017372	-0.2752587	-0.1822958	0.4769959	0.2361557	0.4908826	0.7853981	1.9349899
	1.3361139	0.1733092	0.5643689	2.1093969	2.2824506	1.1762171	1.0376453					
379	0.6970684	0.6970686	0.9233396	0.6282114	0.2014176	-0.2761753	-0.1828017	0.4775929	0.2365158	0.4908826	0.7853981	1.9321604
	1.3345757	0.1737047	0.5639200	2.1094503	2.2829058	1.1753187	1.0364836					
380	0.6962475	0.6962472	0.9228613	0.6272845	0.2010978	-0.2770973	-0.1833033	0.4781951	0.2368748	0.4908826	0.7853981	1.9293137
	1.3330374	0.1741006	0.5634705	2.1095047	2.2833590	1.1744184	1.0353231					
381	0.6954238	0.6954235	0.9223832	0.6263573	0.2007781	-0.2780137	-0.1839006	0.4787918	0.2372356	0.4908826	0.7853981	1.9264994
	1.3314972	0.1744972	0.5630231	2.1095581	2.2838101	1.1735191	1.0341597					
382	0.6946026	0.6946023	0.9219031	0.6254300	0.2004584	-0.2789408	-0.1844951	0.4793942	0.2375926	0.4908826	0.7853981	1.9236412
	1.3299618	0.1748936	0.5625699	2.1096115	2.2842274	1.1726199	1.0330000					
383	0.6937806	0.6937801	0.9214231	0.6245027	0.2001387	-0.2798676	-0.1850873	0.4800033	0.2379506	0.4908826	0.7853981	1.9208050
	1.3284225	0.1752905	0.5621139	2.1096659	2.2846766	1.1717176	1.0318384					
384	0.6929589	0.6929586	0.9209430	0.6235752	0.1998190	-0.2807939	-0.1856731	0.4806129	0.2383082	0.4908826	0.7853981	1.9179497
	1.3268862	0.1756881	0.5616571	2.1097202	2.2851258	1.1708174	1.0306776					
385	0.6921346	0.6921343	0.9204629	0.6226477	0.1994992	-0.2817066	-0.1862579	0.4812258	0.2386667	0.4908826	0.7853981	1.9151783
	1.3253431	0.1760859	0.5612152	2.1097746	2.2855787	1.1699162	1.0295159					
386	0.6912128	0.6912126	0.9199800	0.6217206	0.1991796	-0.2826180	-0.1868369	0.4818426	0.2390224	0.4908826	0.7853981	1.9123259
	1.3238068	0.1764836	0.5607732	2.1098289	2.2860360	1.1690149	1.0283527					
387	0.6904913	0.6904910	0.9194962	0.6207932	0.1988599	-0.2835295	-0.1874178	0.4824634	0.2393764	0.4908826	0.7853981	1.9095078
	1.3222694	0.1768813	0.5603319	2.1098833	2.2864952	1.1681128	1.0271881					

388	0.6896670	0.6896667	0.9190119	0.6198658	0.1985402-0.2844835-0.1882172	0.4830236	0.2397316	0.4908826	0.7853981	1.9067221
	1.3207273	0.1772788	0.5598586	2.1099377	2.2869263 1.1672087 1.0260277					
389	0.6888434	0.6888431	0.9185264	0.6189383	0.1982204-0.2854005-0.1888144	0.4836209	0.2400853	0.4908826	0.7853981	1.9039564
	1.3191862	0.1776767	0.5594059	2.1099930	2.2873793 1.1663055 1.0248042					
390	0.6880209	0.6880206	0.9180408	0.6180110	0.1979007-0.2863281-0.1894186	0.4842288	0.2404381	0.4908826	0.7853981	1.9011478
	1.3176479	0.1780752	0.5589525	2.1100473	2.2878284 1.1654024 1.0237226					
391	0.6871966	0.6871963	0.9175552	0.6170830	0.1975810-0.2872500-0.1900188	0.4848310	0.2407924	0.4908826	0.7853981	1.8983736
	1.3161058	0.1784745	0.5584980	2.1101027	2.2882814 1.1644983 1.0225382					
392	0.6863748	0.6863745	0.9170582	0.6161557	0.1972613-0.2881793-0.1906237	0.4854407	0.2411433	0.4908826	0.7853981	1.8955698
	1.3145685	0.1788734	0.5580440	2.1101580	2.2887306 1.1635942 1.0213776					
393	0.6855475	0.6855472	0.9165813	0.6152279	0.1969416-0.2890844-0.1912129	0.4860260	0.2414982	0.4908826	0.7853981	1.8928833
	1.3130207	0.1792731	0.5575849	2.1102133	2.2891793 1.1626902 1.0202084					
394	0.6847239	0.6847236	0.9160930	0.6143000	0.1966219-0.2900166-0.1918195	0.4866385	0.2418494	0.4908826	0.7853981	1.8900805
	1.3114835	0.1796729	0.5571336	2.1102686	2.2896345 1.1617842 1.0190458					
395	0.6839993	0.6838990	0.9156046	0.6133724	0.1963022-0.2909290-0.1924132	0.4872311	0.2422010	0.4908826	0.7853981	1.8873730
	1.3099365	0.1800731	0.5566778	2.1103249	2.2900963 1.1608801 1.0178826					
396	0.6830738	0.6830735	0.9151135	0.6124444	0.1959825-0.2918526-0.1930143	0.4878350	0.2425508	0.4908826	0.7853981	1.8846216
	1.3083935	0.1804727	0.5562222	2.1103832	2.2905583 1.1599722 1.0167150					
397	0.6822498	0.6822495	0.9146243	0.6115162	0.1956627-0.2927755-0.1936145	0.4884382	0.2429014	0.4908826	0.7853981	1.8818769
	1.3068514	0.1808741	0.5557650	2.1104364	2.2910232 1.1590672 1.0155506					
398	0.6814253	0.6814250	0.9141331	0.6105887	0.1953431-0.2936927-0.1942112	0.4890358	0.2432503	0.4908826	0.7853981	1.8791676
	1.3053083	0.1812746	0.5553085	2.1104927	2.2914541 1.1581612 1.0143862					
399	0.6805980	0.6805977	0.9136412	0.6096605	0.1950234-0.2946040-0.1948037	0.4896274	0.2436005	0.4908826	0.7853981	1.8764906
	1.3037596	0.1816759	0.5548519	2.1105490	2.2919168 1.1572533 1.0132173					
400	0.6797745	0.6797742	0.9131494	0.6087325	0.1947036-0.2955343-0.1954085	0.4902379	0.2439483	0.4908826	0.7853981	1.8737335
	1.3022201	0.1820776	0.5543929	2.1106052	2.2923804 1.1563463 1.0120544					
401	0.6789473	0.6789470	0.9126555	0.6078046	0.1943839-0.2964654-0.1960039	0.4908293	0.2442964	0.4908826	0.7853981	1.8710680
	1.3006725	0.1824789	0.5539352	2.1106615	2.2928276 1.1554384 1.0108862					
402	0.6781188	0.6781185	0.9121603	0.6068763	0.1940642-0.2973962-0.1965935	0.4914204	0.2446444	0.4908826	0.7853981	1.8684111
	1.2991213	0.1828802	0.5534770	2.1107178	2.2932673 1.1545286 1.0097151					
403	0.6772944	0.6772941	0.9116664	0.6059481	0.1937445-0.2982852-0.1971965	0.4920297	0.2449908	0.4908826	0.7853981	1.8656778
	1.2975807	0.1832829	0.5530175	2.1107750	2.2937412 1.1536207 1.0085515					
404	0.6764674	0.6764671	0.9111710	0.6050199	0.1934248-0.2991931-0.1977866	0.4926179	0.2453375	0.4908826	0.7853981	1.8630447
	1.2960320	0.1836854	0.5525581	2.1108322	2.2942019 1.1527119 1.0073824					
405	0.6756409	0.6756406	0.9106743	0.6040918	0.1931051-0.3001162-0.1983863	0.4932213	0.2456826	0.4908826	0.7853981	1.8603497
	1.2944870	0.1840877	0.5520985	2.1108892	2.2946577 1.1518021 1.0062151					
406	0.6748154	0.6748151	0.9101772	0.6031635	0.1927854-0.3010423-0.1989678	0.4938276	0.2460267	0.4908826	0.7853981	1.8576479
	1.2929430	0.1844909	0.5516383	2.1109457	2.2951136 1.1508923 1.0050497					
407	0.6739876	0.6739873	0.9096787	0.6022350	0.1924657-0.3019570-0.1995419	0.4944227	0.2463710	0.4908826	0.7853981	1.8550034
	1.2913942	0.1848940	0.5511779	2.1110039	2.2955732 1.1499815 1.0038835					
408	0.6731604	0.6731601	0.9091804	0.6013067	0.1921459-0.3028739-0.2001771	0.4950199	0.2467151	0.4908826	0.7853981	1.8523540
	1.2898474	0.1852975	0.5507168	2.1110611	2.2960320 1.1490707 1.0027122					
409	0.6723321	0.6723318	0.9086800	0.6003781	0.1918262-0.3037883-0.2007709	0.4956145	0.2470580	0.4908826	0.7853981	1.8497219
	1.2882967	0.1857010	0.5502556	2.1111193	2.2964926 1.1481581 1.0015421					
410	0.6715053	0.6715047	0.9081803	0.5994494	0.1915065-0.3047051-0.2013561	0.4962116	0.2474008	0.4908826	0.7853981	1.8470840
	1.2867498	0.1861055	0.5497933	2.1111765	2.2969522 1.1472473 1.0003738					
411	0.6706767	0.6706764	0.9076798	0.5985208	0.1911868-0.3056212-0.2019406	0.4968081	0.2477436	0.4908826	0.7853981	1.8444557
	1.2852001	0.1865103	0.5493308	2.1112347	2.2974129 1.1463346 0.9992043					
412	0.6698495	0.6698492	0.9071793	0.5975922	0.1908671-0.3065373-0.2025550	0.4974044	0.2480857	0.4908826	0.7853981	1.8418341
	1.2836523	0.1869152	0.5488675	2.1112928	2.2978745 1.1454239 0.9980355					
413	0.6690212	0.6690209	0.9066771	0.5966634	0.1905474-0.3074558-0.2031610	0.4980032	0.2484269	0.4908826	0.7853981	1.8392067
	1.2821035	0.1873203	0.5484042	2.1113510	2.2983351 1.1445112 0.9968657					
414	0.6681901	0.6681898	0.9061736	0.5957345	0.1902277-0.3083605-0.2037674	0.4985882	0.2487689	0.4908826	0.7853981	1.8366451
	1.2805481	0.1877254	0.5479405	2.1114092	2.2987955 1.1435966 0.9956917					
415	0.6673638	0.6673635	0.9056699	0.5948058	0.1899080-0.3092894-0.2043703	0.4991674	0.2491083	0.4908826	0.7853981	1.8339844
	1.2790022	0.1881306	0.5474768	2.1114683	2.2992573 1.1426821 0.9945247					
416	0.6665339	0.6665336	0.9051654	0.5938768	0.1895882-0.3102015-0.2049717	0.4997897	0.2494464	0.4908826	0.7853981	1.8314028
	1.2774496	0.1885365	0.5470131	2.1115265	2.2997217 1.1417685 0.9933529					
417	0.6657051	0.6657047	0.9046586	0.5929476	0.1892685-0.3111188-0.2055705	0.5003873	0.2497848	0.4908826	0.7853981	1.8286040
	1.2758999	0.1889427	0.5465471	2.1115856	2.3001853 1.1408529 0.9921810					
418	0.6648756	0.6648753	0.9041539	0.5920188	0.1889489-0.3120329-0.2061691	0.5009818	0.2501235	0.4908826	0.7853981	1.8262234
	1.2743473	0.1893492	0.5460815	2.1116447	2.3006477 1.1399364 0.9910101					
419	0.6640459	0.6640456	0.9036459	0.5910895	0.1886274-0.3129472-0.2067667	0.5015764	0.2504613	0.4908826	0.7853981	1.8236485
	1.2727957	0.1897560	0.5456155	2.1117039	2.3011112 1.1390228 0.9898383					
420	0.6632153	0.6632150	0.9031370	0.5901603	0.1883054-0.3138583-0.2073622	0.5021678	0.2507964	0.4908826	0.7853981	1.8210936
	1.2712412	0.1901634	0.5451497	2.1117630	2.3015746 1.1381073 0.9886652					
421	0.6623850	0.6623847	0.9026292	0.5892312	0.1879847-0.3147681-0.2079522	0.5027588	0.2511348	0.4908826	0.7853981	1.8185444
	1.2696877	0.1905700	0.5446826	2.1118231	2.3020420 1.1371879 0.9874924					
422	0.6615544	0.6615541	0.9021736	0.5883020	0.1876630-0.3156850-0.2085455	0.5033550	0.2514716	0.4908826	0.7853981	1.8159790
	1.2681341	0.1909774	0.5442151	2.1118822	2.3025074 1.1362734 0.9863191					
423	0.6607231	0.6607228	0.9016117	0.5873721	0.1873503-0.3166052-0.2091251	0.5039455	0.2518078	0.4908826	0.7853981	1.8134451
	1.2665787	0.1913861	0.5437469	2.1119423	2.3029747 1.1353559 0.9851450					

424	0.6598939	0.6598936	0.9010990	0.5864431	0.1870306	-0.3175157	-0.2096712	0.5045463	0.2521405	0.4908826	0.7853981	1.8108711
	1.2650280	0.1917936	0.5432795	2.1120024	2.3034372	1.1344376	0.9839745					
425	0.6590613	0.6590610	0.9305871	0.5855134	0.1867109	-0.3184199	-0.2102566	0.5051308	0.2524756	0.4908826	0.7853981	1.8083725
	1.2634697	0.1922020	0.5428108	2.1120625	2.3039064	1.1335182	0.9827979					
426	0.6582306	0.6582303	0.9000748	0.5845839	0.1863912	-0.3193373	-0.2108505	0.5057285	0.2528089	0.4908826	0.7853981	1.8058233
	1.2619162	0.1926107	0.5423414	2.1121225	2.3043718	1.1325998	0.9816246					
427	0.6573993	0.6573990	0.8995612	0.5836545	0.1860715	-0.3202491	-0.2114437	0.5063206	0.2531415	0.4908826	0.7853981	1.8033028
	1.2603607	0.1930195	0.5418724	2.1121836	2.3048391	1.1316805	0.9804505					
428	0.6565663	0.6565660	0.8990477	0.5827245	0.1857517	-0.3211552	-0.2120279	0.5069069	0.2534754	0.4908826	0.7853981	1.8006118
	1.2584024	0.1934292	0.5414022	2.1122437	2.3053093	1.1307611	0.9792738					
429	0.6557357	0.6557354	0.8985341	0.5817944	0.1854320	-0.3220718	-0.2126201	0.5075038	0.2538077	0.4908826	0.7853981	1.7982826
	1.2572479	0.1938397	0.5409310	2.1123047	2.3057766	1.1298418	0.9781008					
430	0.6549031	0.6549028	0.8980191	0.5808647	0.1851124	-0.3229850	-0.2132077	0.5080924	0.2541397	0.4908826	0.7853981	1.7957926
	1.2556906	0.1942497	0.5404599	2.1123657	2.3062468	1.1289215	0.9769247					
431	0.6540703	0.6540703	0.8975036	0.5799346	0.1847926	-0.3238904	-0.2137964	0.5086830	0.2544716	0.4908826	0.7853981	1.7933006
	1.2541323	0.1946605	0.5399880	2.1124268	2.3067169	1.1280012	0.9757435					
432	0.6532372	0.6532369	0.8969871	0.5790043	0.1844729	-0.3248005	-0.2143849	0.5092734	0.2548028	0.4908826	0.7853981	1.7908134
	1.2525740	0.1950715	0.5395157	2.1124878	2.3071871	1.1270830	0.9745718					
433	0.6524040	0.6524037	0.8964698	0.5780742	0.1841532	-0.3257107	-0.2149734	0.5098639	0.2551333	0.4908826	0.7853981	1.7883320
	1.2510157	0.1954827	0.5390430	2.1125498	2.3076582	1.1261647	0.9733950					
434	0.6515701	0.6515699	0.8959518	0.5771440	0.1838335	-0.3266121	-0.2155561	0.5104455	0.2554635	0.4908826	0.7853981	1.7858934
	1.2494545	0.1958942	0.5385699	2.1126118	2.3081322	1.1252365	0.9722172					
435	0.6507379	0.6507376	0.8954317	0.5762136	0.1835138	-0.3275295	-0.2161493	0.5110433	0.2557907	0.4908826	0.7853981	1.7833920
	1.2478981	0.1963055	0.5380968	2.1126728	2.3086004	1.1243134	0.9710420					
436	0.6499043	0.6499040	0.8949112	0.5752832	0.1831940	-0.3284441	-0.2167431	0.5116382	0.2561183	0.4908826	0.7853981	1.7809076
	1.2463388	0.1967177	0.5376231	2.1127348	2.3090706	1.1233892	0.9698645					
437	0.6490704	0.6490701	0.8943906	0.5743533	0.1828744	-0.3293500	-0.2173354	0.5122244	0.2564460	0.4908826	0.7853981	1.7784643
	1.2447786	0.1971292	0.5371490	2.1127968	2.3095436	1.1224661	0.9686867					
438	0.6482356	0.6482353	0.8938687	0.5734224	0.1825547	-0.3302532	-0.2179289	0.5128079	0.2567734	0.4908826	0.7853981	1.7760372
	1.2432165	0.1975419	0.5366740	2.1128587	2.3100165	1.1215420	0.9675078					
439	0.6474034	0.6474031	0.8933467	0.5724921	0.1822349	-0.3311720	-0.2185022	0.5134069	0.2570987	0.4908826	0.7853981	1.7735519
	1.2416601	0.1979548	0.5361987	2.1129217	2.3104877	1.1206179	0.9663325					
440	0.6465664	0.6465661	0.8928236	0.5715611	0.1819152	-0.3320721	-0.2190835	0.5139873	0.2574263	0.4908826	0.7853981	1.7711477
	1.2400932	0.1983682	0.5357226	2.1129847	2.3109655	1.1196918	0.9651502					
441	0.6457320	0.6457317	0.8922999	0.5706305	0.1815955	-0.3329821	-0.2196710	0.5145776	0.2577516	0.4908826	0.7853981	1.7687082
	1.2385330	0.1987817	0.5352463	2.1130476	2.3114486	1.1187668	0.9639717					
442	0.6448973	0.6448971	0.8917754	0.5696997	0.1812758	-0.3338866	-0.2202548	0.5151624	0.2580767	0.4908826	0.7853981	1.7662973
	1.2369709	0.1991958	0.5347692	2.1131105	2.3119144	1.1178417	0.9627931					
443	0.6440620	0.6440617	0.8912498	0.5687689	0.1809561	-0.3347991	-0.2208438	0.5157552	0.2584003	0.4908826	0.7853981	1.7638578
	1.2354088	0.1996097	0.5342922	2.1131735	2.3123884	1.1169147	0.9616132					
444	0.6432259	0.6432256	0.8907236	0.5678378	0.1806364	-0.3357056	-0.2214287	0.5163420	0.2587246	0.4908826	0.7853981	1.7614479
	1.2338468	0.2000243	0.5338142	2.1132364	2.3128643	1.1159878	0.9604323					
445	0.6423894	0.6423891	0.8901957	0.5669068	0.1803167	-0.3366094	-0.2220119	0.5169261	0.2590473	0.4908826	0.7853981	1.7590532
	1.2322798	0.2004386	0.5333363	2.1133003	2.3133411	1.1150599	0.9592508					
446	0.6415531	0.6415529	0.8896672	0.5659757	0.1799970	-0.3375155	-0.2225963	0.5175124	0.2593693	0.4908826	0.7853981	1.7566557
	1.2307148	0.2008535	0.5328578	2.1133642	2.3138180	1.1141319	0.9580697					
447	0.6407182	0.6407179	0.8891390	0.5650446	0.1796772	-0.3384235	-0.2231817	0.5181007	0.2596908	0.4908826	0.7853981	1.7542543
	1.2291527	0.2012698	0.5323784	2.1134281	2.3142959	1.1132040	0.9568906					
448	0.6398802	0.6398799	0.8886105	0.5641131	0.1793575	-0.3393291	-0.2237657	0.5186866	0.2600141	0.4908826	0.7853981	1.7518682
	1.2275858	0.2016853	0.5318991	2.1134920	2.3147726	1.1122751	0.9557070					
449	0.6390430	0.6390427	0.8880795	0.5631815	0.1790378	-0.3402316	-0.2243475	0.5192694	0.2603345	0.4908826	0.7853981	1.7494984
	1.2260189	0.2021012	0.5314179	2.1135559	2.3152514	1.1113453	0.9545247					
450	0.6382072	0.6382069	0.8875449	0.5622503	0.1787181	-0.3411418	-0.2249292	0.5198593	0.2606543	0.4908826	0.7853981	1.7471037
	1.2244549	0.2025175	0.5309371	2.1136209	2.3157291	1.1104164	0.9533443					
451	0.6373691	0.6373688	0.8870178	0.5613185	0.1783984	-0.3420516	-0.2255134	0.5204421	0.2609754	0.4908826	0.7853981	1.7447462
	1.2228870	0.2029349	0.5304552	2.1136856	2.3162098	1.1094866	0.9521637					
452	0.6365332	0.6365329	0.8864850	0.5603864	0.1780787	-0.3429585	-0.2260988	0.5210372	0.2612931	0.4908826	0.7853981	1.7423429
	1.2213240	0.2033520	0.5299735	2.1137495	2.3166857	1.1085558	0.9509832					
453	0.6356943	0.6356941	0.8859511	0.5594550	0.1777590	-0.3438654	-0.2266842	0.5216134	0.2616127	0.4908826	0.7853981	1.7400188
	1.2197533	0.2037696	0.5294919	2.1138153	2.3171616	1.1076250	0.9498024					
454	0.6348564	0.6348561	0.8854141	0.5585228	0.1774393	-0.3447697	-0.2272697	0.5222000	0.2619311	0.4908826	0.7853981	1.7376595
	1.2181864	0.2041878	0.5290076	2.1138802	2.3176398	1.1066934	0.9486220					
455	0.6340172	0.6340169	0.8848766	0.5575906	0.1771196	-0.3456739	-0.2278553	0.5227835	0.2622505	0.4908826	0.7853981	1.7353277
	1.2166166	0.2046067	0.5285232	2.1139450	2.3181139	1.1057625	0.9474407					
456	0.6331809	0.6331806	0.8843393	0.5566585	0.1767999	-0.3465781	-0.2284415	0.5233745	0.2625665	0.4908826	0.7853981	1.7329483
	1.2150517	0.2050257	0.5280390	2.1140100	2.3185921	1.1048317	0.9462597					
457	0.6322131	0.6322124	0.8838127	0.5557267	0.1764802	-0.3474824	-0.2290252	0.5239520	0.2628845	0.4908826	0.7853981	1.7330360
	1.2132406	0.2054362	0.5275549	2.1140662	2.3188042	1.1038940	0.9450784					
458	0.6314964	0.6314961	0.8833754	0.5547943	0.1761605	-0.3483867	-0.2295989	0.5245161	0.2632031	0.4908826	0.7853981	1.7284184
	1.2118994	0.2058634	0.5270824	2.1141424	2.3195687	1.1029564	0.9438967					
459	0.6305328	0.6305325	0.8828344	0.5538614	0.1758407	-0.3492905	-0.2301719	0.5250952	0.2635202	0.4908826	0.7853981	1.7263907
	1.2103973	0.2062741	0.5266028	2.1142187	2.3200472	1.1020186	0.9427150					

460	0.6296918	0.6296915	0.8821999	0.5529289	0.1755210	-0.3495686	-0.2303604	0.5250896	0.2639180	0.4908826	0.7853981	1.7261019
	1.2085247	0.2066938	0.5263967	2.1142845	2.3207655	1.1010971	0.9413183					
461	0.6288500	0.6288497	0.8816609	0.5519964	0.1752013	-0.3504621	-0.2309351	0.5256634	0.2642342	0.4908826	0.7853981	1.7238216
	1.2069492	0.2071142	0.5256098	2.1143513	2.3212538	1.1001625	0.9401293					
462	0.6283105	0.6283102	0.8811326	0.5510636	0.1748816	-0.3513659	-0.2315164	0.5262475	0.2645496	0.4908826	0.7853981	1.7215033
	1.2053785	0.2075359	0.5251215	2.1144180	2.3217392	1.0992289	0.9389437					
463	0.6271694	0.6271691	0.8805824	0.5501305	0.1745619	-0.3522643	-0.2320942	0.5268263	0.2648641	0.4908826	0.7853981	1.7192116
	1.2038059	0.2079576	0.5246329	2.1144848	2.3222265	1.0982943	0.9377559					
464	0.6263275	0.6263272	0.8800408	0.5491973	0.1742422	-0.3531623	-0.2326714	0.5274045	0.2651781	0.4908826	0.7853981	1.7169266
	1.2022305	0.2083793	0.5241441	2.1145515	2.3227148	1.0973577	0.9365669					
465	0.6254862	0.6254859	0.8794992	0.5482645	0.1739225	-0.3540570	-0.2332464	0.5279795	0.2654914	0.4908826	0.7853981	1.7146597
	1.2006559	0.2088016	0.5236547	2.1146193	2.3232040	1.0964222	0.9353767					
466	0.6246439	0.6246436	0.8789557	0.5473311	0.1736028	-0.3549548	-0.2338235	0.5285575	0.2658038	0.4908826	0.7853981	1.7123842
	1.1990805	0.2092239	0.5231649	2.1146870	2.3236923	1.0954847	0.9341893					
467	0.6238037	0.6238034	0.8784133	0.5463976	0.1732830	-0.3558572	-0.2344034	0.5291402	0.2661158	0.4908826	0.7853981	1.7100954
	1.1975088	0.2096475	0.5226737	2.1147537	2.3241806	1.0945492	0.9330028					
468	0.6229612	0.6229609	0.8778669	0.5454643	0.1729633	-0.3567513	-0.2349777	0.5297146	0.2664276	0.4908826	0.7853981	1.7078438
	1.1959314	0.2100706	0.5221878	2.1148224	2.3246717	1.0936117	0.9318129					
469	0.6221191	0.6221188	0.8773240	0.5445307	0.1726437	-0.3576553	-0.2355543	0.5302990	0.2667385	0.4908826	0.7853981	1.7055559
	1.1943569	0.2104945	0.5216910	2.1148901	2.3251606	1.0926733	0.9306237					
470	0.6212754	0.6212751	0.8767771	0.5435973	0.1723239	-0.3585636	-0.2361287	0.5308675	0.2670485	0.4908826	0.7853981	1.7033358
	1.1927786	0.2109178	0.5211993	2.1149578	2.3256531	1.0917349	0.9294322					
471	0.6204326	0.6204323	0.8762302	0.5426637	0.1720042	-0.3594721	-0.2367056	0.5314463	0.2673581	0.4908826	0.7853981	1.7010803
	1.1912022	0.2113421	0.5207067	2.1150265	2.3261442	1.0907955	0.9282414					
472	0.6195900	0.6195897	0.8756826	0.5417297	0.1716845	-0.3603827	-0.2372837	0.5320272	0.2676668	0.4908826	0.7853981	1.6988211
	1.1896257	0.2117670	0.5202133	2.1150951	2.3266344	1.0898561	0.9270522					
473	0.6187457	0.6187454	0.8751336	0.5407957	0.1713648	-0.3612951	-0.2378563	0.5325999	0.2679754	0.4908826	0.7853981	1.6965981
	1.1880465	0.2121918	0.5197197	2.1151638	2.3271284	1.0889158	0.9258587					
474	0.6179017	0.6179014	0.8745852	0.5398617	0.1710451	-0.3622100	-0.2384306	0.5331751	0.2682843	0.4908826	0.7853981	1.6943693
	1.1864662	0.2126175	0.5192249	2.1152334	2.3276224	1.0879755	0.9246679					
475	0.6170577	0.6170574	0.8740348	0.5389279	0.1707254	-0.3631246	-0.2390046	0.5337500	0.2685914	0.4908826	0.7853981	1.6921453
	1.1848888	0.2130429	0.5187303	2.1153021	2.3281155	1.0870342	0.9234760					
476	0.6162132	0.6162129	0.8734842	0.5379934	0.1704057	-0.3639215	-0.2395798	0.5343271	0.2688988	0.4908826	0.7853981	1.6899185
	1.1833086	0.2134694	0.5182344	2.1153717	2.3286095	1.0860929	0.9222834					
477	0.6153690	0.6153687	0.8729314	0.5370591	0.1700860	-0.3648180	-0.2401547	0.5349039	0.2692038	0.4908826	0.7853981	1.6876965
	1.1817293	0.2138954	0.5177389	2.1154413	2.3291035	1.0851507	0.9210913					
478	0.6145232	0.6145229	0.8723784	0.5361247	0.1697662	-0.3657061	-0.2407240	0.5354723	0.2695096	0.4908826	0.7853981	1.6855106
	1.1801462	0.2143220	0.5172424	2.1155109	2.3296013	1.0842075	0.9198968					
479	0.6136786	0.6136783	0.8718249	0.5351901	0.1694465	-0.3666049	-0.2413003	0.5360515	0.2698145	0.4908826	0.7853981	1.6832886
	1.1785669	0.2147493	0.5167452	2.1155806	2.3300953	1.0832644	0.9187042					
480	0.6128337	0.6128334	0.8712705	0.5342553	0.1691268	-0.3674975	-0.2418722	0.5366243	0.2701185	0.4908826	0.7853981	1.6810951
	1.1769857	0.2151769	0.5162473	2.1156511	2.3305922	1.0823212	0.9175110					
481	0.6119878	0.6119875	0.8707165	0.5333205	0.1688071	-0.3683928	-0.2424459	0.5371999	0.2704237	0.4908826	0.7853981	1.6788950
	1.1754036	0.2156055	0.5157487	2.1157217	2.3310890	1.0813780	0.9163164					
482	0.6111426	0.6111423	0.8701611	0.5323855	0.1684874	-0.3692905	-0.2430211	0.5377780	0.2707271	0.4908826	0.7853981	1.6766891
	1.1738224	0.2160342	0.5152491	2.1157923	2.3315859	1.0804338	0.9151230					
483	0.6102967	0.6102964	0.8696048	0.5314505	0.1681677	-0.3701868	-0.2435938	0.5383525	0.2710301	0.4908826	0.7853981	1.6745014
	1.1722431	0.2164631	0.5147493	2.1158629	2.3320837	1.0794888	0.9139284					
484	0.6094488	0.6094485	0.8690498	0.5305151	0.1678480	-0.3710859	-0.2441579	0.5389138	0.2713349	0.4908826	0.7853981	1.6723690
	1.1706624	0.2168931	0.5142482	2.1159344	2.3325822	1.0785446	0.9127311					
485	0.6086020	0.6086017	0.8684916	0.5295795	0.1675283	-0.3719879	-0.2447204	0.5394682	0.2716377	0.4908826	0.7853981	1.6701899
	1.1690693	0.2173234	0.5137466	2.1160059	2.3330870	1.0775995	0.9115353					
486	0.6077544	0.6077545	0.8679336	0.5286440	0.1672086	-0.3728936	-0.2452824	0.5400621	0.2719401	0.4908826	0.7853981	1.6680164
	1.1674843	0.2177541	0.5132445	2.1160765	2.3335876	1.0766535	0.9103389					
487	0.6069084	0.6069081	0.8673746	0.5277081	0.1668888	-0.3737996	-0.2458358	0.5406384	0.2722411	0.4908826	0.7853981	1.6658392
	1.1659012	0.2181852	0.5127417	2.1161480	2.3340874	1.0757074	0.9091436					
488	0.6060613	0.6060610	0.8668148	0.5267725	0.1665692	-0.3747065	-0.2463851	0.5412086	0.2725416	0.4908826	0.7853981	1.6636887
	1.1643162	0.2186164	0.5122387	2.1162205	2.3345890	1.0747604	0.9079475					
489	0.6052131	0.6052128	0.8662550	0.5258365	0.1662495	-0.3756271	-0.2469299	0.5417766	0.2728432	0.4908826	0.7853981	1.6615505
	1.1627293	0.2190486	0.5117344	2.1162929	2.3350935	1.0738144	0.9067498					
490	0.6043652	0.6043649	0.8656934	0.5249004	0.1659297	-0.3764492	-0.2474734	0.5423389	0.2731426	0.4908826	0.7853981	1.6594309
	1.1611423	0.2194807	0.5112301	2.1163645	2.3355961	1.0728684	0.9055523					
491	0.6035156	0.6035153	0.8651305	0.5239643	0.1656100	-0.3773058	-0.2481503	0.5429154	0.2734423	0.4908826	0.7853981	1.6572752
	1.1595535	0.2199124	0.5107253	2.1164370	2.3361006	1.0719175	0.9043527					
492	0.6026683	0.6026680	0.8645679	0.5230281	0.1652903	-0.3782091	-0.2487220	0.5434804	0.2737405	0.4908826	0.7853981	1.6551247
	1.1579676	0.2203440	0.5102195	2.1165094	2.3366041	1.0709696	0.9031562					
493	0.6018191	0.6018188	0.8640035	0.5220918	0.1649706	-0.3791186	-0.2492903	0.5440596	0.2740384	0.4908826	0.7853981	1.6529970
	1.1563787	0.2207759	0.5097135	2.1165829	2.3371086	1.0700197	0.9019570					
494	0.6009693	0.6009690	0.8634388	0.5211553	0.1646509	-0.3800369	-0.2498576	0.5446278	0.2743363	0.4908826	0.7853981	1.6508789
	1.1547890	0.2212124	0.5092066	2.1166563	2.3376150	1.0690694	0.9007579					
495	0.6001206	0.6001203	0.8628733	0.5202198	0.1643312	-0.3809670	-0.2504269	0.5451991	0.2746327	0.4908826	0.7853981	1.6487522
	1.1532011	0.2216489	0.5086991	2.1167297	2.3381205	1.0681208	0.8995586					

496	0.5992704	0.5992701	0.8623071	0.5192819	0.1640115	-0.3817554	-0.2537437	0.5457668	0.2749298	0.4908826	0.7853981	1.6466636
	1.1516113	0.2220816	0.5081908	2.1168032	2.3386278	1.0671692	0.4983582					
497	0.5984200	0.5984197	0.8617397	0.5183449	0.1636918	-0.3826455	-0.2515623	0.5463373	0.2752258	0.4908826	0.7853981	1.6445284
	1.1500206	0.2225166	0.5076820	2.1160766	2.3391342	1.0662174	0.4971573					
498	0.5975688	0.5975685	0.8611714	0.5174080	0.1633720	-0.3835248	-0.2521237	0.5468968	0.2755213	0.4908826	0.7853981	1.6424570
	1.1484270	0.2229518	0.5071727	2.1169510	2.3396454	1.0652657	0.4959553					
499	0.5967187	0.5967184	0.8606034	0.5164708	0.1630523	-0.3844191	-0.2526965	0.5474715	0.2758164	0.4908826	0.7853981	1.6403341
	1.1468372	0.2233879	0.5066622	2.1170254	2.3401527	1.0643139	0.4947549					
500	0.5958681	0.5958678	0.8600329	0.5155337	0.1627326	-0.3853081	-0.2532519	0.5480407	0.2761096	0.4908826	0.7853981	1.6382360
	1.1452456	0.2238236	0.5061521	2.1170998	2.3406610	1.0633602	0.4935539					
501	0.5951168	0.5951165	0.8594614	0.5145965	0.1624129	-0.3861939	-0.2538271	0.5486069	0.2764024	0.4908826	0.7853981	1.6361523
	1.1436529	0.2242597	0.5056413	2.1171741	2.3411703	1.0624065	0.4923517					
502	0.5941657	0.5941654	0.8588893	0.5136590	0.1620932	-0.3870850	-0.2543956	0.5491782	0.2766945	0.4908826	0.7853981	1.6340532
	1.1420603	0.2246961	0.5051296	2.1172475	2.3416796	1.0614519	0.4911501					
503	0.5933135	0.5933132	0.8583178	0.5127213	0.1617735	-0.3879703	-0.2549552	0.5497438	0.2769880	0.4908826	0.7853981	1.6319790
	1.1404667	0.2251344	0.5046164	2.1173208	2.3421917	1.0604982	0.4899467					
504	0.5924616	0.5924613	0.8577461	0.5117831	0.1614538	-0.3888532	-0.2555265	0.5503120	0.2772810	0.4908826	0.7853981	1.6298990
	1.1388731	0.2255729	0.5041025	2.1173942	2.3427038	1.0595446	0.4887433					
505	0.5916092	0.5916089	0.8571718	0.5108454	0.1611341	-0.3897426	-0.2560902	0.5508766	0.2775719	0.4908826	0.7853981	1.6278372
	1.1372786	0.2260109	0.5035887	2.1174675	2.3432159	1.0585890	0.4875402					
506	0.5907563	0.5907560	0.8565960	0.5099074	0.1608143	-0.3906244	-0.2566522	0.5514387	0.2778618	0.4908826	0.7853981	1.6257868
	1.1356821	0.2264491	0.5030748	2.1175418	2.3437300	1.0576324	0.4863354					
507	0.5899037	0.5899034	0.8560200	0.5089695	0.1604947	-0.3915133	-0.2572187	0.5520080	0.2781513	0.4908826	0.7853981	1.6237144
	1.1340876	0.2268878	0.5025600	2.1176281	2.3442421	1.0566750	0.4851320					
508	0.5890497	0.5890494	0.8554423	0.5080312	0.1601750	-0.3923919	-0.2577785	0.5525669	0.2784401	0.4908826	0.7853981	1.6216841
	1.1324892	0.2273267	0.5020447	2.1177044	2.3447580	1.0557175	0.4839281					
509	0.5881947	0.5881944	0.8548644	0.5070924	0.1598552	-0.3932751	-0.2583411	0.5531304	0.2787296	0.4908826	0.7853981	1.6196413
	1.1308899	0.2277663	0.5015284	2.1177807	2.3452740	1.0547590	0.4827189					
510	0.5873418	0.5873415	0.8542866	0.5061542	0.1595355	-0.3941560	-0.2589004	0.5536915	0.2790176	0.4908826	0.7853981	1.6175737
	1.1292953	0.2282069	0.5010111	2.1178570	2.3457870	1.0538015	0.4815145					
511	0.5864867	0.5864864	0.8537036	0.5052152	0.1592158	-0.3950464	-0.2594593	0.5542622	0.2793061	0.4908826	0.7853981	1.6155481
	1.1276951	0.2286489	0.5004920	2.1179342	2.3463069	1.0528440	0.4803073					
512	0.5856328	0.5856325	0.8531311	0.5042762	0.1588961	-0.3959265	-0.2600305	0.5548246	0.2795963	0.4908826	0.7853981	1.6135187
	1.1260977	0.2290909	0.4999727	2.1180115	2.3468246	1.0518866	0.4791015					
513	0.5847779	0.5847776	0.8525514	0.5033368	0.1585764	-0.3968107	-0.2605920	0.5553870	0.2798842	0.4908826	0.7853981	1.6114941
	1.1244974	0.2295333	0.4994528	2.1180897	2.3473434	1.0509272	0.4778945					
514	0.5839233	0.5839230	0.8519700	0.5023977	0.1582567	-0.3976998	-0.2611577	0.5559565	0.2801701	0.4908826	0.7853981	1.6094675
	1.1228991	0.2299756	0.4989328	2.1181669	2.3478603	1.0499668	0.4766879					
515	0.5830691	0.5830688	0.8513879	0.5014583	0.1579370	-0.3985863	-0.2617216	0.5565233	0.2804552	0.4908826	0.7853981	1.6074142
	1.1213007	0.2304183	0.4984120	2.1182451	2.3483782	1.0490065	0.4754818					
516	0.5822132	0.5822129	0.8508065	0.5005187	0.1576173	-0.3994648	-0.2622834	0.5570821	0.2807424	0.4908826	0.7853981	1.6054134
	1.1196925	0.2308624	0.4978906	2.1183233	2.3488958	1.0480471	0.4742752					
517	0.5813569	0.5813566	0.8502241	0.4995789	0.1572976	-0.4003418	-0.2628418	0.5576454	0.2810287	0.4908826	0.7853981	1.6034302
	1.1180983	0.2313069	0.4973667	2.1184015	2.3494215	1.0470867	0.4730683					
518	0.5805012	0.5805009	0.8496391	0.4986390	0.1569778	-0.4012310	-0.2634033	0.5582088	0.2813121	0.4908826	0.7853981	1.6013908
	1.1164970	0.2317509	0.4968439	2.1184807	2.3499422	1.0461245	0.4718602					
519	0.5796437	0.5796434	0.8490556	0.4976984	0.1566581	-0.4021056	-0.2639642	0.5587637	0.2815983	0.4908826	0.7853981	1.5994139
	1.1148930	0.2321964	0.4963192	2.1185598	2.3504677	1.0451641	0.4706453					
520	0.5787881	0.5787878	0.8484706	0.4967577	0.1563385	-0.4029901	-0.2645213	0.5593287	0.2818818	0.4908826	0.7853981	1.5974054
	1.1132917	0.2326423	0.4957944	2.1186390	2.3509893	1.0442019	0.4694273					
521	0.5779301	0.5779298	0.8478823	0.4958186	0.1560187	-0.4038722	-0.2650715	0.5598909	0.2821639	0.4908826	0.7853981	1.5954103
	1.1116877	0.2330872	0.4952710	2.1187181	2.3515126	1.0432367	0.4682059					
522	0.5770723	0.5770720	0.8472939	0.4948782	0.1556990	-0.4047511	-0.2656198	0.5604501	0.2824466	0.4908826	0.7853981	1.5934296
	1.1100826	0.2335334	0.4947459	2.1187973	2.3520374	1.0422735	0.4669843					
523	0.5762138	0.5762135	0.8467046	0.4939377	0.1553793	-0.4056296	-0.2661665	0.5610039	0.2827287	0.4908826	0.7853981	1.5914717
	1.1084757	0.2339799	0.4942179	2.1188784	2.3525644	1.0413084	2.8658625					
524	0.5753552	0.5753549	0.8461171	0.4929969	0.1550596	-0.4065068	-0.2667121	0.5615624	0.2830102	0.4908826	0.7853981	1.5895004
	1.1068697	0.2344270	0.4936893	2.1189595	2.3530934	1.0403442	0.4645703					
525	0.5744985	0.5744982	0.8455287	0.4920557	0.1547399	-0.4073835	-0.2672574	0.5621334	0.2832915	0.4908826	0.7853981	1.5874891
	1.1052675	0.2348758	0.4931608	2.1190388	2.3536248	1.0393801	0.4633438					
526	0.5736401	0.5736398	0.8449379	0.4911144	0.1544202	-0.4082716	-0.2678042	0.5626912	0.2835715	0.4908826	0.7853981	1.5855274
	1.1036615	0.2353237	0.4926322	2.1191196	2.3541582	1.0384160	0.4621169					
527	0.5727809	0.5727806	0.8443451	0.4901739	0.1541005	-0.4091479	-0.2683505	0.5632484	0.2838502	0.4908826	0.7853981	1.5835705
	1.1020536	0.2357717	0.4921032	2.1192007	2.3546935	1.0374470	0.4608898					
528	0.5719202	0.5719199	0.8437522	0.4892325	0.1537806	-0.4100218	-0.2688955	0.5638005	0.2841305	0.4908826	0.7853981	1.5816355
	1.1004429	0.2362208	0.4915727	2.1192818	2.3552317	1.0364729	0.4596624					
529	0.5710606	0.5710604	0.8431581	0.4882910	0.1534613	-0.4108931	-0.2694389	0.5643626	0.2844077	0.4908826	0.7853981	1.5796690
	1.0988359	0.2366698	0.4910423	2.1193628	2.3557741	1.0354941	0.4584344					
530	0.5702003	0.5702000	0.8425640	0.4873493	0.1531419	-0.4117626	-0.2699801	0.5649189	0.2846861	0.4908826	0.7853981	1.5777273
	1.0972261	0.2371199	0.4905116	2.1194438	2.3563171	1.0345093	0.4572055					
531	0.5693404	0.5693402	0.8419695	0.4864076	0.1528224	-0.4126298	-0.2705193	0.5654802	0.2849638	0.4908826	0.7853981	1.5757704
	1.0956174	0.2375705	0.4899777	2.1195249	2.3568605	1.0335244	0.4559757					

532	0.5684798	0.5684796	0.8413737	0.4854653	0.1525019	-0.4135317	-0.2712399	0.5660335	0.2852409	0.4908826	0.7853981	1.5738440
	1.0940075	0.2380219	0.4894440	2.1196098	2.3573236	1.0326080	0.8548434					
533	0.5676191	0.5676189	0.8407780	0.4845235	0.1521822	-0.4144092	-0.2717558	0.5665914	0.2855182	0.4908826	0.7853981	1.5719061
	1.0923967	0.2384736	0.4889097	2.1196918	2.3578568	1.0316391	0.8536681					
534	0.5667572	0.5667570	0.8401802	0.4835812	0.1518625	-0.4152811	-0.2723181	0.5671436	0.2857941	0.4908826	0.7853981	1.5699911
	1.0907841	0.2389255	0.4883750	2.1197748	2.3583908	1.0306683	0.8524513					
535	0.5658963	0.5658960	0.8395802	0.4826388	0.1515428	-0.4161594	-0.2728737	0.5677012	0.2860675	0.4908826	0.7853981	1.5680609
	1.0891733	0.2393773	0.4878401	2.1198574	2.3589239	1.0296974	0.8512357					
536	0.5650339	0.5650337	0.8389803	0.4816964	0.1512231	-0.4170375	-0.2734302	0.5682606	0.2863415	0.4908826	0.7853981	1.5661278
	1.0875607	0.2398295	0.4873044	2.1199417	2.3594570	1.0287247	0.8500183					
537	0.5641711	0.5641709	0.8383797	0.4807538	0.1509033	-0.4179084	-0.2739814	0.5688117	0.2866159	0.4908826	0.7853981	1.5642262
	1.0859470	0.2402827	0.4867675	2.1200247	2.3599899	1.0277538	0.8488002					
538	0.5633090	0.5633088	0.8377774	0.4798109	0.1505836	-0.4187869	-0.2745273	0.5693705	0.2868881	0.4908826	0.7853981	1.5623026
	1.0843334	0.2407361	0.4862303	2.1201086	2.3605230	1.0267801	0.8475831					
539	0.5624465	0.5624462	0.8371748	0.4788679	0.1502640	-0.4196630	-0.2750699	0.5699240	0.2871602	0.4908826	0.7853981	1.5603991
	1.0827198	0.2411901	0.4856921	2.1201935	2.3610559	1.0258074	0.8463653					
540	0.5615822	0.5615821	0.8365709	0.4779247	0.1499442	-0.4205325	-0.2756117	0.5704768	0.2874321	0.4908826	0.7853981	1.5585022
	1.0811033	0.2416444	0.4851533	2.1202774	2.3616028	1.0248327	0.8451451					
541	0.5607191	0.5607191	0.8359689	0.4769813	0.1496245	-0.4214075	-0.2761553	0.5710320	0.2877051	0.4908826	0.7853981	1.5565996
	1.0794888	0.2421005	0.4846124	2.1203623	2.3621426	1.0238609	0.8439269					
542	0.5598550	0.5598548	0.8353636	0.4760375	0.1493048	-0.4223847	-0.2767007	0.5715895	0.2879760	0.4908826	0.7853981	1.5546932
	1.0778725	0.2425563	0.4840716	2.1204472	2.3626834	1.0228853	0.8427068					
543	0.5589908	0.5589905	0.8347585	0.4750940	0.1489851	-0.4231535	-0.2772481	0.5721386	0.2882470	0.4908826	0.7853981	1.5528183
	1.0762548	0.2430126	0.4835299	2.1205330	2.3632221	1.0219107	0.8414866					
544	0.5581269	0.5581266	0.8341519	0.4741499	0.1486654	-0.4240298	-0.2777925	0.5726952	0.2885157	0.4908826	0.7853981	1.5509214
	1.0746384	0.2434691	0.4829879	2.1206188	2.3637609	1.0209341	0.8402669					
545	0.5572627	0.5572624	0.8335437	0.4732059	0.1483456	-0.4249037	-0.2783347	0.5732493	0.2887848	0.4908826	0.7853981	1.5490360
	1.0730209	0.2439265	0.4824447	2.1207047	2.3643026	1.0199585	0.8390470					
546	0.5563978	0.5563976	0.8329355	0.4722620	0.1480260	-0.4257765	-0.2788759	0.5738025	0.2890533	0.4908826	0.7853981	1.5471573
	1.0714035	0.2443839	0.4819011	2.1207905	2.3648443	1.0189819	0.8378260					
547	0.5555330	0.5555327	0.8323268	0.4713177	0.1477063	-0.4266486	-0.2794158	0.5743528	0.2893222	0.4908826	0.7853981	1.5452919
	1.0697842	0.2448424	0.4813562	2.1208763	2.3653879	1.0180059	0.8366036					
548	0.5546683	0.5546680	0.8317196	0.4703730	0.1473866	-0.4275241	-0.2799543	0.5749106	0.2895886	0.4908826	0.7853981	1.5434036
	1.0681648	0.2453007	0.4808111	2.1209631	2.3659296	1.0170299	0.8353810					
549	0.5537980	0.5537980	0.8311069	0.4694281	0.1470668	-0.4283932	-0.2804915	0.5754500	0.2898592	0.4908826	0.7853981	1.5415802
	1.0665407	0.2457611	0.4802637	2.1210508	2.3664739	1.0160494	0.8341560					
550	0.5529327	0.5529324	0.8304962	0.4684829	0.1467471	-0.4292575	-0.2810273	0.5760046	0.2901261	0.4908826	0.7853981	1.5397109
	1.0649214	0.2462217	0.4797158	2.1211376	2.3670244	1.0150704	0.8329341					
551	0.5520669	0.5520667	0.8298849	0.4675376	0.1464274	-0.4301288	-0.2815630	0.5765562	0.2903935	0.4908826	0.7853981	1.5378523
	1.0633002	0.2466829	0.4791670	2.1212254	2.3675718	1.0140924	0.8317105					
552	0.5511982	0.5511980	0.8292722	0.4665923	0.1461077	-0.4309945	-0.2820983	0.5771022	0.2906598	0.4908826	0.7853981	1.5360165
	1.0616760	0.2471441	0.4786180	2.1213131	2.3681202	1.0131130	0.8304855					
553	0.5503311	0.5503311	0.8286595	0.4656467	0.1457880	-0.4318677	-0.2826335	0.5776557	0.2909261	0.4908826	0.7853981	1.5341587
	1.0600548	0.2476064	0.4780675	2.1214016	2.3686686	1.0121336	0.8292618					
554	0.5494626	0.5494624	0.8280447	0.4647012	0.1454683	-0.4327327	-0.2831689	0.5782010	0.2911913	0.4908826	0.7853981	1.5323315
	1.0584287	0.2480685	0.4775169	2.1214905	2.3692180	1.0111532	0.8280354					
555	0.5485953	0.5485951	0.8274298	0.4637552	0.1451486	-0.4336053	-0.2836999	0.5787538	0.2914556	0.4908826	0.7853981	1.5304813
	1.0568066	0.2485317	0.4769650	2.1215792	2.3697681	1.0101728	0.8268111					
556	0.5477272	0.5477269	0.8268119	0.4628091	0.1448289	-0.4344747	-0.2842267	0.5793036	0.2917178	0.4908826	0.7853981	1.5286455
	1.0551825	0.2489944	0.4764132	2.1216679	2.3703175	1.0091896	0.8255856					
557	0.5468574	0.5468571	0.8261953	0.4618627	0.1445091	-0.4353387	-0.2847530	0.5798479	0.2919828	0.4908826	0.7853981	1.5268316
	1.0535556	0.2494584	0.4758593	2.1217575	2.3708715	1.0082083	0.8243577					
558	0.5459883	0.5459880	0.8255792	0.4609164	0.1441895	-0.4362100	-0.2852788	0.5803995	0.2922462	0.4908826	0.7853981	1.5249949
	1.0519314	0.2499241	0.4753045	2.1218472	2.3714237	1.0072269	0.8231272					
559	0.5451194	0.5451192	0.8249597	0.4599699	0.1438698	-0.4370733	-0.2858044	0.5809431	0.2925080	0.4908826	0.7853981	1.5231886
	1.0503035	0.2503887	0.4747499	2.1219368	2.3719778	1.0062428	0.8218943					
560	0.5442484	0.5442480	0.8243396	0.4590232	0.1435500	-0.4379362	-0.2863296	0.5814892	0.2927699	0.4908826	0.7853981	1.5213776
	1.0486746	0.2508560	0.4741943	2.1220274	2.3725328	1.0052586	0.8206583					
561	0.5433794	0.5433792	0.8237177	0.4580767	0.1432303	-0.4388118	-0.2868546	0.5820421	0.2930311	0.4908826	0.7853981	1.5195465
	1.0470486	0.2513205	0.4736372	2.1221180	2.3730900	1.0042744	0.8194201					
562	0.5425103	0.5425101	0.8230978	0.4571290	0.1429106	-0.4396741	-0.2873792	0.5825947	0.2932916	0.4908826	0.7853981	1.5177517
	1.0454187	0.2517870	0.4730796	2.1222086	2.3736429	1.0032892	0.8181784					
563	0.5416414	0.5416412	0.8224759	0.4561819	0.1425909	-0.4405414	-0.2879032	0.5831473	0.2935497	0.4908826	0.7853981	1.5159445
	1.0437849	0.2522532	0.4725215	2.1223001	2.3741949	1.0023032	0.8169330					
564	0.5407725	0.5407722	0.8218534	0.4552346	0.1422712	-0.4414077	-0.2884266	0.5836988	0.2938090	0.4908826	0.7853981	1.5141139
	1.0421510	0.2527204	0.4719633	2.1223907	2.3747559	1.0013170	0.8156797					
565	0.5399032	0.5399030	0.8212292	0.4542868	0.1419515	-0.4422765	-0.2889496	0.5842480	0.2940667	0.4908826	0.7853981	1.5123367
	1.0405152	0.2531884	0.4714035	2.1224833	2.3753228	1.0003270	0.8144247					
566	0.5390338	0.5390336	0.8206045	0.4533391	0.1416318	-0.4431457	-0.2894720	0.5847953	0.2943232	0.4908826	0.7853981	1.5120020
	1.0388722	0.2536577	0.4708435	2.1225783	2.3760366	0.9993326	0.8131595					
567	0.5381647	0.5381645	0.8199744	0.4523910	0.1413121	-0.4440099	-0.2899937	0.5853403	0.2945785	0.4908826	0.7853981	1.5088120
	1.0372269	0.2541271	0.4702814	2.1226683	2.3766391	0.9983330	0.8118843					

568	0.5371831	0.5371829	0.8193476	0.4514425	0.1409923	-0.4444246	-0.2907023	0.5854169	0.2949036	0.4908826	0.7853981	1.5084352
	1.0354557	0.2545871	0.4697178	2.1227703	2.3771601	0.9973662	0.8107013					
569	0.5364021	0.5364019	0.8187210	0.4504941	0.1406726	-0.4457176	-0.2915151	0.5863903	0.2951001	0.4908826	0.7853981	1.5052519
	1.0339956	0.2550680	0.4691535	2.1228542	2.3775625	0.9963784	0.8095990					
570	0.5354359	0.5354356	0.8180919	0.4495454	0.1403529	-0.4461489	-0.2917859	0.5865018	0.2954175	0.4908826	0.7853981	1.5048885
	1.0321875	0.2555290	0.4685802	2.1229572	2.3782664	0.9953885	0.8082350					
571	0.5345619	0.5345616	0.8174635	0.4485967	0.1400332	-0.4470080	-0.2923254	0.5870413	0.2956743	0.4908826	0.7853981	1.5031281
	1.0305529	0.2560019	0.4680234	2.1230507	2.3788519	0.9943995	0.8070013					
572	0.5336874	0.5336872	0.8168332	0.4476476	0.1397135	-0.4478669	-0.2928645	0.5875804	0.2959296	0.4908826	0.7853981	1.5013723
	1.0289164	0.2564732	0.4674570	2.1231451	2.3794184	0.9934090	0.8057669					
573	0.5328130	0.5328127	0.8162037	0.4466982	0.1393938	-0.4487503	-0.2934063	0.5881241	0.2961857	0.4908826	0.7853981	1.4996052
	1.0272809	0.2569469	0.4668888	2.1232395	2.3799849	0.9924194	0.8045327					
574	0.5319374	0.5319371	0.8155723	0.4457487	0.1390741	-0.4495859	-0.2939432	0.5886600	0.2964408	0.4908826	0.7853981	1.4978647
	1.0256424	0.2574207	0.4663203	2.1233339	2.3805542	0.9914284	0.8032967					
575	0.5310618	0.5310616	0.8149400	0.4447998	0.1387544	-0.4504486	-0.2944842	0.5892029	0.2966952	0.4908826	0.7853981	1.4961052
	1.0240049	0.2578952	0.4657506	2.1234293	2.3811226	0.9904367	0.8020609					
576	0.5301864	0.5301861	0.8143069	0.4438490	0.1384346	-0.4513138	-0.2950268	0.5897484	0.2969488	0.4908826	0.7853981	1.4943399
	1.0223675	0.2583702	0.4651802	2.1235247	2.3816900	0.9894446	0.8008251					
577	0.5293097	0.5293095	0.8136709	0.4428993	0.1381149	-0.4521655	-0.2955607	0.5902804	0.2972002	0.4908826	0.7853981	1.4926214
	1.0207262	0.2588445	0.4646102	2.1236210	2.3822613	0.9884503	0.7995877					
578	0.5284342	0.5284340	0.8130364	0.4419488	0.1377953	-0.4530321	-0.2961039	0.5908274	0.2974527	0.4908826	0.7853981	1.4908571
	1.0190897	0.2593213	0.4640375	2.1237164	2.3828306	0.9874573	0.7983521					
579	0.5275579	0.5275577	0.8124009	0.4409983	0.1374756	-0.4538886	-0.2966406	0.5913641	0.2977045	0.4908826	0.7853981	1.4891291
	1.0174484	0.2597979	0.4634643	2.1238136	2.3834038	0.9864638	0.7971151					
580	0.5266805	0.5266802	0.8117643	0.4400477	0.1371558	-0.4547470	-0.2971783	0.5919028	0.2979563	0.4908826	0.7853981	1.4873972
	1.0158072	0.2602752	0.4628902	2.1239100	2.3839769	0.9854695	0.7958765					
581	0.5258029	0.5258027	0.8111270	0.4390966	0.1368361	-0.4556047	-0.2977154	0.5924408	0.2982076	0.4908826	0.7853981	1.4856701
	1.0141659	0.2607535	0.4623148	2.1240072	2.3845516	0.9844748	0.7946379					
582	0.5249249	0.5249247	0.8104879	0.4381456	0.1365164	-0.4564628	-0.2982528	0.5929792	0.2984573	0.4908826	0.7853981	1.4839449
	1.0125237	0.2612315	0.4617392	2.1241045	2.3851261	0.9834787	0.7933987					
583	0.5240468	0.5240466	0.8098493	0.4371942	0.1361967	-0.4573202	-0.2987896	0.5935169	0.2987078	0.4908826	0.7853981	1.4822254
	1.0108805	0.2617112	0.4611619	2.1242027	2.3857021	0.9824833	0.7921593					
584	0.5231683	0.5231681	0.8092085	0.4362428	0.1358770	-0.4581743	-0.2993240	0.5940514	0.2989563	0.4908826	0.7853981	1.4805174
	1.0092363	0.2621904	0.4605844	2.1243010	2.3862801	0.9814863	0.7909194					
585	0.5222897	0.5222895	0.8085681	0.4352912	0.1355573	-0.4590359	-0.2998633	0.5945932	0.2992055	0.4908826	0.7853981	1.4787893
	1.0075941	0.2626711	0.4600053	2.1243992	2.3868561	0.9804898	0.7896793					
586	0.5214098	0.5214096	0.8079253	0.4343390	0.1352376	-0.4598896	-0.3003970	0.5951272	0.2994534	0.4908826	0.7853981	1.4770889
	1.0059471	0.2631519	0.4594256	2.1244984	2.3874359	0.9794913	0.7884374					
587	0.5205308	0.5205305	0.8072838	0.4333869	0.1349179	-0.4607456	-0.3009323	0.5956634	0.2997019	0.4908826	0.7853981	1.4753838
	1.0043030	0.2636340	0.4588442	2.1245975	2.3880157	0.9784942	0.7871966					
588	0.5196507	0.5196505	0.8066393	0.4324346	0.1345981	-0.4616013	-0.3014670	0.5961991	0.2999483	0.4908826	0.7853981	1.4736843
	1.0026560	0.2641163	0.4582627	2.1246967	2.3885905	0.9774948	0.7859545					
589	0.5187695	0.5187693	0.8059953	0.4314823	0.1342784	-0.4624560	-0.3020014	0.5967345	0.3001960	0.4908826	0.7853981	1.4719868
	1.0010080	0.2645993	0.4576795	2.1247969	2.3891702	0.9764960	0.7847107					
590	0.5178891	0.5178889	0.8053504	0.4305294	0.1339588	-0.4633082	-0.3025359	0.5972570	0.3004423	0.4908826	0.7853981	1.4703026
	0.9993607	0.2650829	0.4570956	2.1248970	2.3897429	0.9754966	0.7834682					
591	0.5170088	0.5170085	0.8047024	0.4295765	0.1336390	-0.4641705	-0.3030726	0.5978095	0.3006858	0.4908826	0.7853981	1.4685879
	0.9977142	0.2655663	0.4565117	2.1249971	2.3903127	0.9744969	0.7822257					
592	0.5161270	0.5161268	0.8040558	0.4286233	0.1333193	-0.4650217	-0.3036091	0.5983410	0.3009315	0.4908826	0.7853981	1.4669113
	0.9960648	0.2660512	0.4559236	2.1250982	2.3908824	0.9734944	0.7809811					
593	0.5152457	0.5152455	0.8034080	0.4276699	0.1329996	-0.4658750	-0.3041373	0.5988752	0.3011758	0.4908826	0.7853981	1.4652290
	0.9944157	0.2665370	0.4553387	2.1251993	2.3914546	0.9724932	0.7797378					
594	0.5143634	0.5143632	0.8027596	0.4267160	0.1326799	-0.4667315	-0.3046717	0.5994114	0.3014206	0.4908826	0.7853981	1.4635429
	0.9927654	0.2670236	0.4547503	2.1253014	2.3920213	0.9714915	0.7784922					
595	0.5134802	0.5134799	0.8021085	0.4257624	0.1323602	-0.4675816	-0.3052021	0.5999418	0.3016632	0.4908826	0.7853981	1.4618778
	0.9911128	0.2675095	0.4541622	2.1254034	2.3925897	0.9704880	0.7772455					
596	0.5125985	0.5125983	0.8014572	0.4248085	0.1320404	-0.4684252	-0.3057320	0.6004796	0.3019046	0.4908826	0.7853981	1.4601917
	0.9894630	0.2679965	0.4535724	2.1255064	2.3931602	0.9694844	0.7759972					
597	0.5117143	0.5117141	0.8008047	0.4238545	0.1317205	-0.4692603	-0.3062614	0.6010170	0.3021455	0.4908826	0.7853981	1.4585419
	0.9878086	0.2684843	0.4529824	2.1256104	2.3937265	0.9684799	0.7747533					
598	0.5108311	0.5108309	0.8001517	0.4229003	0.1314011	-0.4700932	-0.3067899	0.6015543	0.3023865	0.4908826	0.7853981	1.4568624
	0.9861569	0.2689729	0.4523933	2.1257154	2.3942869	0.9674761	0.7735068					
599	0.5099474	0.5099471	0.7995078	0.4219453	0.1310813	-0.4709222	-0.3073171	0.6020785	0.3026260	0.4908826	0.7853981	1.4551954
	0.9845037	0.2694614	0.4517942	2.1258214	2.3948472	0.9664719	0.7722577					
600	0.5090618	0.5090615	0.7988445	0.4209902	0.1307616	-0.4717496	-0.3078376	0.6026021	0.3028655	0.4908826	0.7853981	1.4535646
	0.9828463	0.2699519	0.4511946	2.1259284	2.3954074	0.9654674	0.7710054					
601	0.5081760	0.5081756	0.7981811	0.4200347	0.1304419	-0.4725743	-0.3083564	0.6031258	0.3031115	0.4908826	0.7853981	1.4519043
	0.9811913	0.2704431	0.4505941	2.1260362	2.3959624	0.9644631	0.7697508					
602	0.5072930	0.5072927	0.7975164	0.4190779	0.1301222	-0.4733963	-0.3088731	0.6036465	0.3033507	0.4908826	0.7853981	1.4502506
	0.9795375	0.2709344	0.4499918	2.1261442	2.3965175	0.9634585	0.7684936					
603	0.5064067	0.5064065	0.7968779	0.4181210	0.1298025	-0.4742155	-0.3093877	0.6041948	0.3035906	0.4908826	0.7853981	1.4486055
	0.9778799	0.2714260	0.4493856	2.1262531	2.3970726	0.9624536	0.7672334					

604	0.5055209	0.5055206	0.7962204	0.4171678	0.1294828	-0.4752434	-0.3099759	0.6047262	0.3038694	0.4908826	0.7853981	1.4469728
	0.9762218	0.2719198	0.4488160	2.1263399	2.3980265	0.9614399	0.7660127					
605	0.5046347	0.5046344	0.7955621	0.4162122	0.1291631	-0.4760923	-0.3105052	0.6052554	0.3040677	0.4908826	0.7853981	1.4453373
	0.9745640	0.2724132	0.4482168	2.1264458	2.3986244	0.9604323	0.7647619					
606	0.5037478	0.5037476	0.7949013	0.4152557	0.1288434	-0.4769438	-0.3110350	0.6057872	0.3043042	0.4908826	0.7853981	1.4436960
	0.9729056	0.2729067	0.4476169	2.1265516	2.3992224	0.9594225	0.7635104					
607	0.5028606	0.5028604	0.7942398	0.4142995	0.1285236	-0.4777921	-0.3115627	0.6063157	0.3045403	0.4908826	0.7853981	1.4420671
	0.9712452	0.2734009	0.4470161	2.1266584	2.3998222	0.9584125	0.7622582					
608	0.5019726	0.5019724	0.7935772	0.4133428	0.1282039	-0.4786375	-0.3120883	0.6068414	0.3047759	0.4908826	0.7853981	1.4404488
	0.9695841	0.2738956	0.4464143	2.1267653	2.4004240	0.9574016	0.7610051					
609	0.5010853	0.5010851	0.7929144	0.4123861	0.1278842	-0.4794905	-0.3126188	0.6073747	0.3050110	0.4908826	0.7853981	1.4388103
	0.9679243	0.2743912	0.4458112	2.1268730	2.4010248	0.9563909	0.7597530					
610	0.5001969	0.5001967	0.7922512	0.4114290	0.1275645	-0.4803376	-0.3131453	0.6079022	0.3052454	0.4908826	0.7853981	1.4371929
	0.9662623	0.2748874	0.4452071	2.1269804	2.4016275	0.9553791	0.7584993					
611	0.4993086	0.4993083	0.7915859	0.4104717	0.1272448	-0.4811845	-0.3136715	0.6084293	0.3054799	0.4908826	0.7853981	1.4355774
	0.9645999	0.2753847	0.4446015	2.1270895	2.4022322	0.9543675	0.7572457					
612	0.4984180	0.4984177	0.7909184	0.4095141	0.1269251	-0.4820260	-0.3141943	0.6089512	0.3057127	0.4908826	0.7853981	1.4339819
	0.9629337	0.2758815	0.4439958	2.1271982	2.4028387	0.9533531	0.7559898					
613	0.4975288	0.4975286	0.7902539	0.4085560	0.1266054	-0.4828745	-0.3147210	0.6094798	0.3059478	0.4908826	0.7853981	1.4323673
	0.9612709	0.2763811	0.4433872	2.1273069	2.4034452	0.9523417	0.7547343					
614	0.4966397	0.4966395	0.7895868	0.4075980	0.1262857	-0.4837226	-0.3152478	0.6100085	0.3061803	0.4908826	0.7853981	1.4307547
	0.9596069	0.2768806	0.4427782	2.1274166	2.4040527	0.9513283	0.7534794					
615	0.4957495	0.4957493	0.7889172	0.4066399	0.1259660	-0.4845709	-0.3157742	0.6105368	0.3064111	0.4908826	0.7853981	1.4291458
	0.9579415	0.2773797	0.4421691	2.1275263	2.4046602	0.9503130	0.7522233					
616	0.4948603	0.4948598	0.7882474	0.4056817	0.1256463	-0.4854200	-0.3163015	0.6110669	0.3066416	0.4908826	0.7853981	1.4275351
	0.9562774	0.2778799	0.4415587	2.1276369	2.4052677	0.9492981	0.7509683					
617	0.4939671	0.4939668	0.7875769	0.4047226	0.1253266	-0.4862579	-0.3168209	0.6115844	0.3068733	0.4908826	0.7853981	1.4259644
	0.9546071	0.2783810	0.4409465	2.1277475	2.4058819	0.9482818	0.7497080					
618	0.4930769	0.4930767	0.7869069	0.4037639	0.1250069	-0.4871045	-0.3173459	0.6121114	0.3071038	0.4908826	0.7853981	1.4243660
	0.9529411	0.2788833	0.4403332	2.1278591	2.4064932	0.9472670	0.7484518					
619	0.4921845	0.4921842	0.7862344	0.4028046	0.1246871	-0.4879483	-0.3178690	0.6126354	0.3073337	0.4908826	0.7853981	1.4227800
	0.9512722	0.2793857	0.4397190	2.1279707	2.4071064	0.9462498	0.7471925					
620	0.4912924	0.4912922	0.7855614	0.4018450	0.1243674	-0.4887944	-0.3183935	0.6131619	0.3075629	0.4908826	0.7853981	1.4211893
	0.9496036	0.2798892	0.4391035	2.1280823	2.4077196	0.9452326	0.7459337					
621	0.4903997	0.4903995	0.7848867	0.4008855	0.1240477	-0.4896352	-0.3189145	0.6136829	0.3077909	0.4908826	0.7853981	1.4196177
	0.9479328	0.2803929	0.4384874	2.1281948	2.4083357	0.9442141	0.7446740					
622	0.4895069	0.4895067	0.7842130	0.3999256	0.1237280	-0.4904777	-0.3194355	0.6142058	0.3080201	0.4908826	0.7853981	1.4180422
	0.9462627	0.2808980	0.4378674	2.1283083	2.4089527	0.9431968	0.7434142					
623	0.4886137	0.4886135	0.7835358	0.3989656	0.1234083	-0.4913225	-0.3199565	0.6147308	0.3082462	0.4908826	0.7853981	1.4164619
	0.9445918	0.2814027	0.4372513	2.1284218	2.4095688	0.9421766	0.7421539					
624	0.4877195	0.4877192	0.7828588	0.3980051	0.1230886	-0.4921646	-0.3204810	0.6152532	0.3084734	0.4908826	0.7853981	1.4148932
	0.9429188	0.2819089	0.4366213	2.1285353	2.4101877	0.9411568	0.7408923					
625	0.4868246	0.4868244	0.7821818	0.3970442	0.1227689	-0.4930035	-0.3210003	0.6157724	0.3087009	0.4908826	0.7853981	1.4133348
	0.9412446	0.2824163	0.4360097	2.1286497	2.4108095	0.9401371	0.7396298					
626	0.4859303	0.4859301	0.7815039	0.3960835	0.1224492	-0.4938474	-0.3215225	0.6162965	0.3089272	0.4908826	0.7853981	1.4117651
	0.9395715	0.2829240	0.4353873	2.1287642	2.4114304	0.9391171	0.7383674					
627	0.4850362	0.4850360	0.7808246	0.3951222	0.1221294	-0.4946910	-0.3220445	0.6168205	0.3091524	0.4908826	0.7853981	1.4101982
	0.9378988	0.2834327	0.4347636	2.1288795	2.4120522	0.9380959	0.7371058					
628	0.4841403	0.4841400	0.7801435	0.3941608	0.1218097	-0.4955312	-0.3225663	0.6173409	0.3093770	0.4908826	0.7853981	1.4086437
	0.9362223	0.2839415	0.4341391	2.1289949	2.4126759	0.9370735	0.7358417					
629	0.4832438	0.4832436	0.7794637	0.3931994	0.1214901	-0.4963660	-0.3230861	0.6178560	0.3096032	0.4908826	0.7853981	1.4071083
	0.9345461	0.2844518	0.4335128	2.1291103	2.4133024	0.9360525	0.7345767					
630	0.4823480	0.4823477	0.7787805	0.3922373	0.1211703	-0.4972110	-0.3236025	0.6183713	0.3098259	0.4908826	0.7853981	1.4055443
	0.9328697	0.2849621	0.4328860	2.1292276	2.4139271	0.9350286	0.7333121					
631	0.4814508	0.4814505	0.7780959	0.3912752	0.1208506	-0.4980474	-0.3241172	0.6188980	0.3100503	0.4908826	0.7853981	1.4040079
	0.9311908	0.2854726	0.4322576	2.1293443	2.4145555	0.9340054	0.7320467					
632	0.4805543	0.4805540	0.7774108	0.3903129	0.1205309	-0.4988835	-0.3246317	0.6194204	0.3102725	0.4908826	0.7853981	1.4024563
	0.9295141	0.2859858	0.4316291	2.1294613	2.4151831	0.9329814	0.7307814					
633	0.4796568	0.4796566	0.7767302	0.3893501	0.1202112	-0.4997254	-0.3251558	0.6199365	0.3104961	0.4908826	0.7853981	1.4009266
	0.9278346	0.2864995	0.4309965	2.1295795	2.4158144	0.9319574	0.7295155					
634	0.4787594	0.4787592	0.7760451	0.3883872	0.1198915	-0.5005683	-0.3256761	0.6204597	0.3107162	0.4908826	0.7853981	1.3993778
	0.9261562	0.2870134	0.4303644	2.1296978	2.4164458	0.9309333	0.7282493					
635	0.4778606	0.4778604	0.7753586	0.3874241	0.1195718	-0.5014035	-0.3261917	0.6209753	0.3109400	0.4908826	0.7853981	1.3978529
	0.9244747	0.2875279	0.4297311	2.1298161	2.4170771	0.9299077	0.7269812					
636	0.4769627	0.4769624	0.7746706	0.3864607	0.1192521	-0.5022434	-0.3267099	0.6214954	0.3111600	0.4908826	0.7853981	1.3963184
	0.9227945	0.2880430	0.4290969	2.1299353	2.4177084	0.9288812	0.7257113					
637	0.4760630	0.4760627	0.7739816	0.3854969	0.1189324	-0.5030778	-0.3272247	0.6220102	0.3113802	0.4908826	0.7853981	1.3948011
	0.9211116	0.2885589	0.4284613	2.1300554	2.4183395	0.9278538	0.7244399					
638	0.4751643	0.4751641	0.7732922	0.3845330	0.1186126	-0.5039196	-0.3277439	0.6225222	0.3115993	0.4908826	0.7853981	1.3932638
	0.9194305	0.2890754	0.4278243	2.1301756	2.4189707	0.9268265	0.7231770					
639	0.4742644	0.4742641	0.7725913	0.3835689	0.1182929	-0.5047559	-0.3282565	0.6230308	0.3118181	0.4908826	0.7853981	1.3917456
	0.9177464	0.2895929	0.4271864	2.1302958	2.4196157	0.9257979	0.7219123					

640	0.4733639	0.4733636	0.7719096	0.3826047	0.1179732	-0.5055916	-0.3287745	0.6235648	0.3120363	0.4908826	0.7853981	1.3902321
	0.9160620	0.2901108	0.4265472	2.1304169	2.4202538	0.9247692	0.7206358					
641	0.4724634	0.4724631	0.7712171	0.3816400	0.1176535	-0.5064297	-0.3292910	0.6240832	0.3122541	0.4908826	0.7853981	1.3887119
	0.9143773	0.2906299	0.4259066	2.1305389	2.4200927	0.9237398	0.7193663					
642	0.4715618	0.4715616	0.7705249	0.3806748	0.1173338	-0.5072619	-0.3298336	0.6245958	0.3124728	0.4908826	0.7853981	1.3872118
	0.9126904	0.2911503	0.4252641	2.1306610	2.4199359	0.9227109	0.7180944					
643	0.4706605	0.4706603	0.7698316	0.3797096	0.1170141	-0.5080966	-0.3303176	0.6251107	0.3126904	0.4908826	0.7853981	1.3857069
	0.9110043	0.2916713	0.4246204	2.1307840	2.4197783	0.9216813	0.7168227					
644	0.4697588	0.4697586	0.7691371	0.3787442	0.1166944	-0.5089338	-0.3308331	0.6256282	0.3129073	0.4908826	0.7853981	1.3841972
	0.9093171	0.2921930	0.4239757	2.1309071	2.4196210	0.9206510	0.7155505					
645	0.4688560	0.4688558	0.7684402	0.3777785	0.1163747	-0.5097673	-0.3313460	0.6261420	0.3131225	0.4908826	0.7853981	1.3827300
	0.9076287	0.2927148	0.4233303	2.1310301	2.4194637	0.9196186	0.7142769					
646	0.4679527	0.4679524	0.7677422	0.3768123	0.1160550	-0.5106013	-0.3318593	0.6266562	0.3133373	0.4908826	0.7853981	1.3812037
	0.9059383	0.2932374	0.4226835	2.1311541	2.4193064	0.9185855	0.7130024					
647	0.4670506	0.4670503	0.7670440	0.3758463	0.1157352	-0.5114393	-0.3323747	0.6271745	0.3135509	0.4908826	0.7853981	1.3796978
	0.9042511	0.2937610	0.4220355	2.1312790	2.4191491	0.9175528	0.7117298					
648	0.4661466	0.4661463	0.7663459	0.3748798	0.1154156	-0.5122716	-0.3328864	0.6276872	0.3137661	0.4908826	0.7853981	1.3782110
	0.9025599	0.2942856	0.4213855	2.1314039	2.4189919	0.9165202	0.7104565					
649	0.4652424	0.4652422	0.7656464	0.3739129	0.1150959	-0.5131015	-0.3333966	0.6281974	0.3139801	0.4908826	0.7853981	1.3767319
	0.9009676	0.2948114	0.4207343	2.1315298	2.4188369	0.9154866	0.7091769					
650	0.4643373	0.4643371	0.7649451	0.3729458	0.1147761	-0.5139337	-0.3339081	0.6287099	0.3141951	0.4908826	0.7853981	1.3752489
	0.8991748	0.2953374	0.4200821	2.1316557	2.4186798	0.9144516	0.7079018					
651	0.4634332	0.4634331	0.7642449	0.3719783	0.1144564	-0.5147677	-0.3344205	0.6292241	0.3144066	0.4908826	0.7853981	1.3737640
	0.8974833	0.2958653	0.4194277	2.1317825	2.4185228	0.9134179	0.7066265					
652	0.4625276	0.4625273	0.7635425	0.3710106	0.1141367	-0.5155988	-0.3349309	0.6297355	0.3146192	0.4908826	0.7853981	1.3722678
	0.8957888	0.2963933	0.4187725	2.1319094	2.4183658	0.9123825	0.7053488					
653	0.4616224	0.4616222	0.7628391	0.3700428	0.1138170	-0.5164327	-0.3354427	0.6302491	0.3148304	0.4908826	0.7853981	1.3708386
	0.8940957	0.2969221	0.4181161	2.1320372	2.4182088	0.9113466	0.7040723					
654	0.4607159	0.4607155	0.7621350	0.3690749	0.1134973	-0.5172630	-0.3359509	0.6307573	0.3150421	0.4908826	0.7853981	1.3693466
	0.8923995	0.2974515	0.4174585	2.1321650	2.4180518	0.9103103	0.7027928					
655	0.4598093	0.4598091	0.7614292	0.3681362	0.1131776	-0.5180926	-0.3364616	0.6312702	0.3152521	0.4908826	0.7853981	1.3678732
	0.8907039	0.2979819	0.4167994	2.1322937	2.4178948	0.9092726	0.7015142					
656	0.4589021	0.4589019	0.7607225	0.3671376	0.1128579	-0.5189222	-0.3369707	0.6317800	0.3154618	0.4908826	0.7853981	1.3664103
	0.8890064	0.2985128	0.4161391	2.1324234	2.4177378	0.9082344	0.7002345					
657	0.4579943	0.4579940	0.7600159	0.3661686	0.1125382	-0.5197515	-0.3374794	0.6322897	0.3156720	0.4908826	0.7853981	1.3649492
	0.8873083	0.2990451	0.4154771	2.1325531	2.4175808	0.9071966	0.6989537					
658	0.4570860	0.4570857	0.7593073	0.3651993	0.1122184	-0.5205778	-0.3379860	0.6327963	0.3158808	0.4908826	0.7853981	1.3634996
	0.8856081	0.2995776	0.4148142	2.1326838	2.4174239	0.9061570	0.6976724					
659	0.4561779	0.4561777	0.7585985	0.3642299	0.1118987	-0.5214090	-0.3384955	0.6333076	0.3160895	0.4908826	0.7853981	1.3620386
	0.8839102	0.3001115	0.4141494	2.1328144	2.4172669	0.9051181	0.6963910					
660	0.4552693	0.4552690	0.7578875	0.3632601	0.1115790	-0.5222394	-0.3390063	0.6338184	0.3162963	0.4908826	0.7853981	1.3605824
	0.8822101	0.3006457	0.4134839	2.1329460	2.4171099	0.9040772	0.6951097					
661	0.4543602	0.4543600	0.7571759	0.3622903	0.1112593	-0.5230669	-0.3395112	0.6343263	0.3165029	0.4908826	0.7853981	1.3591347
	0.8805096	0.3011805	0.4127971	2.1330776	2.4169530	0.9030360	0.6938275					
662	0.4533821	0.4533818	0.7564645	0.3613200	0.1109396	-0.5239745	-0.3400161	0.6348341	0.3167059	0.4908826	0.7853981	1.3576006
	0.8788795	0.3017064	0.4121082	2.1332097	2.4167915	0.9019953	0.6924477					
663	0.4525390	0.4525388	0.7557518	0.3603493	0.1106199	-0.5247162	-0.3405210	0.6353361	0.3169177	0.4908826	0.7853981	1.3562632
	0.8771020	0.3022539	0.4114179	2.1333437	2.4166352	0.9009537	0.6912595					
664	0.4515614	0.4515612	0.7550371	0.3593783	0.1103002	-0.5254308	-0.3410251	0.6358310	0.3171674	0.4908826	0.7853981	1.3547100
	0.8752733	0.3027817	0.4107005	2.1334787	2.4164790	0.8999105	0.6898696					
665	0.4506496	0.4506492	0.7543248	0.3584069	0.1099805	-0.5260522	-0.3413287	0.6360326	0.3173757	0.4908826	0.7853981	1.3542881
	0.8735673	0.3033217	0.4101322	2.1336212	2.4163227	0.8988697	0.6885741					
666	0.4497384	0.4497381	0.7536077	0.3574355	0.1096607	-0.5268781	-0.3418460	0.6365389	0.3175790	0.4908826	0.7853981	1.3528538
	0.8718628	0.3038607	0.4094584	2.1337566	2.4161664	0.8978251	0.6872881					
667	0.4488261	0.4488259	0.7528912	0.3564637	0.1093411	-0.5277335	-0.3423667	0.6370445	0.3177834	0.4908826	0.7853981	1.3514242
	0.8701563	0.3044012	0.4087825	2.1338921	2.4160102	0.8967811	0.6860018					
668	0.4479132	0.4479130	0.7521737	0.3554916	0.1090214	-0.5285936	-0.3428911	0.6375450	0.3179875	0.4908826	0.7853981	1.3500099
	0.8684480	0.3049425	0.4081051	2.1340275	2.4158541	0.8957365	0.6847155					
669	0.4470007	0.4470005	0.7514548	0.3545194	0.1087018	-0.5294509	-0.3434157	0.6380525	0.3181902	0.4908826	0.7853981	1.3485785
	0.8667412	0.3054846	0.4074276	2.1341639	2.4156980	0.8946910	0.6834293					
670	0.4460877	0.4460868	0.7507355	0.3535464	0.1083819	-0.5303126	-0.3439378	0.6385546	0.3183933	0.4908826	0.7853981	1.3471642
	0.8650318	0.3060277	0.4067463	2.1343012	2.4155418	0.8936453	0.6821376					
671	0.4451733	0.4451733	0.7500147	0.3525738	0.1080622	-0.5311993	-0.3444612	0.6390589	0.3185952	0.4908826	0.7853981	1.3457460
	0.8633222	0.3065717	0.4060646	2.1344395	2.4153857	0.8925996	0.6808469					
672	0.4442589	0.4442589	0.7492935	0.3516002	0.1077425	-0.5320894	-0.3449861	0.6395628	0.3187972	0.4908826	0.7853981	1.3443298
	0.8616111	0.3071170	0.4053819	2.1345778	2.4152295	0.8915517	0.6795562					
673	0.4433445	0.4433443	0.7485722	0.3506268	0.1074228	-0.5329835	-0.3455108	0.6400663	0.3189991	0.4908826	0.7853981	1.3429174
	0.8599012	0.3076633	0.4046994	2.1347163	2.4150734	0.8905053	0.6782655					
674	0.4424309	0.4424297	0.7478506	0.3496529	0.1071031	-0.5338888	-0.3460403	0.6405719	0.3192009	0.4908826	0.7853981	1.3415012
	0.8581902	0.3082109	0.4040168	2.1348553	2.4149173	0.8894587	0.6769795					
675	0.4415144	0.4415142	0.7471278	0.3486784	0.1067834	-0.5348041	-0.3465849	0.6410695	0.3194024	0.4908826	0.7853981	1.3401089
	0.8564773	0.3087592	0.4033204	2.1349955	2.4147611	0.8884113	0.6757002					

676	0.4405986	0.4405984	0.7464020	0.3477045	0.1064637	-0.5351104	-0.3458715	0.6415740	0.3196012	0.4908826	0.7853981	1.3386993
	0.8547635	0.3093073	0.4026316	2.1351366	2.4442577	0.8873616	0.6744167					
677	0.4396816	0.4396814	0.7456737	0.3467299	0.1061440	-0.5359321	-0.3473726	0.6420761	0.3197984	0.4908826	0.7853981	1.3372993
	0.8520488	0.3098558	0.4019418	2.1352777	2.4449663	0.8863098	0.6731233					
678	0.4387647	0.4387645	0.7449466	0.3457548	0.1058242	-0.5367532	-0.3488730	0.6425774	0.3199970	0.4908826	0.7853981	1.3359022
	0.8513328	0.3104061	0.4012495	2.1354198	2.4456377	0.8852594	0.6718301					
679	0.4378478	0.4378470	0.7442189	0.3447795	0.1055045	-0.5375744	-0.3503735	0.6430789	0.3201954	0.4908826	0.7853981	1.3345060
	0.8496168	0.3109576	0.4005554	2.1355619	2.4463316	0.8842089	0.6705362					
680	0.4369301	0.4369298	0.7434877	0.3438041	0.1051869	-0.5383943	-0.3518728	0.6435792	0.3203921	0.4908826	0.7853981	1.3331165
	0.8479006	0.3115095	0.3998604	2.1357050	2.4470243	0.8831572	0.6692426					
681	0.4360114	0.4360112	0.7427599	0.3428281	0.1048651	-0.5392120	-0.3533708	0.6440771	0.3205895	0.4908826	0.7853981	1.3317337
	0.8461817	0.3120627	0.3991634	2.1358490	2.4477215	0.8821052	0.6679471					
682	0.4350928	0.4350926	0.7420276	0.3418521	0.1045454	-0.5400341	-0.3548713	0.6445795	0.3207844	0.4908826	0.7853981	1.3303513
	0.8444635	0.3126160	0.3984657	2.1359940	2.4484177	0.8810514	0.6666515					
683	0.4341738	0.4341736	0.7412944	0.3408757	0.1042257	-0.5408534	-0.3563649	0.6450791	0.3209790	0.4908826	0.7853981	1.3289585
	0.8427442	0.3131703	0.3977664	2.1361389	2.4491158	0.8799971	0.6653554					
684	0.4332539	0.4332537	0.7405621	0.3398989	0.1039060	-0.5416579	-0.3578607	0.6455759	0.3211750	0.4908826	0.7853981	1.3275852
	0.8410231	0.3137264	0.3970646	2.1362848	2.4498177	0.8789438	0.6640581					
685	0.4323344	0.4323341	0.7398289	0.3389216	0.1035863	-0.5424929	-0.3593671	0.6460792	0.3213701	0.4908826	0.7853981	1.3261957
	0.8393031	0.3142838	0.3963600	2.1364307	2.4505186	0.8778899	0.6627613					
686	0.4314132	0.4314129	0.7390938	0.3379444	0.1032666	-0.5433086	-0.3608631	0.6465752	0.3215644	0.4908826	0.7853981	1.3248281
	0.8375797	0.3148412	0.3956565	2.1365776	2.4512234	0.8768347	0.6614621					
687	0.4304920	0.4304917	0.7383575	0.3369668	0.1029469	-0.5441240	-0.3623588	0.6470709	0.3217577	0.4908826	0.7853981	1.3234634
	0.8358561	0.3153995	0.3949504	2.1367254	2.4519291	0.8757787	0.6601630					
688	0.4295714	0.4295712	0.7376200	0.3359891	0.1026272	-0.5449460	-0.3638582	0.6475731	0.3219495	0.4908826	0.7853981	1.3220825
	0.8341341	0.3159586	0.3942432	2.1368732	2.4526339	0.8747220	0.6588684					
689	0.4286487	0.4286485	0.7368804	0.3350108	0.1023074	-0.5457681	-0.3653515	0.6480655	0.3221409	0.4908826	0.7853981	1.3207302
	0.8324077	0.3165182	0.3935345	2.1370230	2.4533434	0.8736637	0.6575635					
690	0.4277258	0.4277256	0.7361426	0.3340329	0.1019877	-0.5465923	-0.3668460	0.6485600	0.3223342	0.4908826	0.7853981	1.3193741
	0.8306811	0.3170803	0.3928227	2.1371727	2.4540548	0.8726071	0.6562622					
691	0.4268043	0.4268038	0.7354034	0.3330550	0.1016680	-0.5474330	-0.3683441	0.6490610	0.3225256	0.4908826	0.7853981	1.3180027
	0.8289568	0.3176432	0.3921097	2.1373224	2.4547653	0.8715497	0.6549623					
692	0.4258800	0.4258798	0.7346617	0.3320737	0.1013483	-0.5482862	-0.3698377	0.6495545	0.3227161	0.4908826	0.7853981	1.3166523
	0.8272282	0.3182061	0.3913957	2.1374731	2.4554787	0.8704903	0.6536592					
693	0.4249560	0.4249558	0.7339203	0.3310944	0.1010286	-0.5491214	-0.3713323	0.6500500	0.3229068	0.4908826	0.7853981	1.3152990
	0.8254998	0.3187704	0.3906798	2.1376247	2.4561939	0.8694316	0.6523564					
694	0.4240324	0.4240322	0.7331778	0.3301145	0.1007089	-0.5499586	-0.3728278	0.6505475	0.3230965	0.4908826	0.7853981	1.3139610
	0.8237716	0.3193359	0.3899620	2.1377773	2.4569101	0.8683721	0.6510539					
695	0.4231080	0.4231079	0.7324333	0.3291346	0.1003892	-0.5508032	-0.3743218	0.6510424	0.3232848	0.4908826	0.7853981	1.3125925
	0.8220420	0.3199015	0.3892433	2.1379309	2.4576273	0.8673111	0.6497505					
696	0.4221829	0.4221827	0.7316883	0.3281541	0.1000695	-0.5516671	-0.3758153	0.6515366	0.3234732	0.4908826	0.7853981	1.3112478
	0.8203113	0.3204686	0.3885226	2.1380844	2.4583473	0.8662500	0.6484460					
697	0.4212570	0.4212564	0.7309414	0.3271734	0.0997497	-0.5525309	-0.3773081	0.6520306	0.3236604	0.4908826	0.7853981	1.3099060
	0.8185792	0.3210363	0.3878005	2.1382389	2.4590683	0.8651876	0.6471404					
698	0.4203303	0.4203302	0.7301933	0.3261925	0.0994300	-0.5533949	-0.3787993	0.6525243	0.3238471	0.4908826	0.7853981	1.3085651
	0.8168459	0.3216045	0.3870770	2.1383934	2.4597912	0.8641243	0.6458333					
699	0.4194035	0.4194033	0.7294455	0.3252115	0.0991104	-0.5542610	-0.3802886	0.6530151	0.3240352	0.4908826	0.7853981	1.3072357
	0.8151115	0.3221752	0.3863505	2.1385498	2.4605179	0.8630625	0.6445268					
700	0.4184771	0.4184769	0.7286980	0.3242292	0.0987906	-0.5551196	-0.3817749	0.6535103	0.3242215	0.4908826	0.7853981	1.3058949
	0.8133784	0.3227465	0.3856227	2.1387062	2.4612496	0.8619994	0.6432205					
701	0.4175491	0.4175490	0.7279484	0.3232472	0.0984709	-0.5559817	-0.3832762	0.6540026	0.3244078	0.4908826	0.7853981	1.3045635
	0.8116423	0.3233186	0.3848534	2.1388636	2.4619722	0.8609357	0.6419122					
702	0.4166210	0.4166209	0.7271966	0.3222649	0.0981512	-0.5568413	-0.3847661	0.6544925	0.3245923	0.4908826	0.7853981	1.3032408
	0.8099059	0.3238912	0.3841628	2.1390219	2.4626928	0.8598703	0.6406035					
703	0.4156927	0.4156925	0.7264442	0.3212820	0.0978315	-0.5577170	-0.3862593	0.6549885	0.3247765	0.4908826	0.7853981	1.3019037
	0.8081694	0.3244652	0.3834302	2.1391802	2.4634123	0.8588046	0.6392947					
704	0.4147636	0.4147635	0.7256911	0.3202992	0.0975118	-0.5585956	-0.3877481	0.6554773	0.3249605	0.4908826	0.7853981	1.3005867
	0.8064314	0.3250399	0.3826963	2.1393394	2.4641306	0.8577389	0.6379847					
705	0.4138338	0.4138336	0.7249370	0.3193157	0.0971920	-0.5594763	-0.3892381	0.6559683	0.3251443	0.4908826	0.7853981	1.2992659
	0.8046917	0.3256150	0.3819597	2.1394997	2.4648469	0.8566722	0.6366735					
706	0.4129043	0.4129041	0.7241815	0.3183324	0.0968724	-0.5603591	-0.3907264	0.6564585	0.3253264	0.4908826	0.7853981	1.2979498
	0.8029524	0.3261923	0.3812224	2.1396608	2.4655582	0.8556049	0.6353632					
707	0.4119732	0.4119731	0.7234248	0.3173485	0.0965527	-0.5613961	-0.3922167	0.6569487	0.3255086	0.4908826	0.7853981	1.2966337
	0.8012111	0.3267698	0.3804832	2.1398220	2.4662663	0.8545367	0.6340504					
708	0.4110424	0.4110422	0.7226682	0.3163642	0.0962330	-0.5623051	-0.3937051	0.6574381	0.3256908	0.4908826	0.7853981	1.2953234
	0.7994694	0.3273491	0.3797415	2.1399851	2.4669773	0.8534689	0.6327341					
709	0.4101107	0.4101105	0.7219139	0.3153798	0.0959132	-0.5632117	-0.3951919	0.6579250	0.3258711	0.4908826	0.7853981	1.2940197
	0.7977262	0.3279282	0.3789991	2.1401482	2.4676883	0.8523990	0.6314244					
710	0.4091786	0.4091784	0.7211596	0.3143945	0.0955935	-0.5642206	-0.3966741	0.6584141	0.3260528	0.4908826	0.7853981	1.2927122
	0.7959826	0.3285099	0.3782554	2.1403122	2.4683941	0.8513302	0.6301104					
711	0.4082468	0.4082466	0.7203923	0.3134094	0.0952738	-0.5652389	-0.3981686	0.6589046	0.3262346	0.4908826	0.7853981	1.2914028
	0.7942396	0.3290926	0.3775061	2.1404762	2.4690999	0.8502621	0.6287957					

712	0.4073144	0.4073142	0.7196313	0.3124238	0.0949541	-0.5644410	-0.3646573	0.6593952	0.3264138	0.4908826	0.7853981	1.2900953
	0.7924951	0.3296757	0.3767575	2.1406422	2.4700966	0.8491915	0.6274822					
713	0.4063808	0.4063808	0.7188697	0.3114377	0.0946344	-0.5652484	-0.3651441	0.6598828	0.3265935	0.4908826	0.7853981	1.2887964
	0.7907490	0.3302601	0.3760068	2.1408081	2.4708462	0.8481207	0.6261662					
714	0.4054472	0.4054470	0.7181059	0.3104516	0.0943147	-0.5660530	-0.3656289	0.6603677	0.3267714	0.4908826	0.7853981	1.2875071
	0.7890016	0.3308449	0.3752550	2.1409760	2.4715977	0.8470485	0.6248498					
715	0.4045124	0.4045122	0.7173423	0.3094651	0.0939950	-0.5669570	-0.3661132	0.6608520	0.3269501	0.4908826	0.7853981	1.2862206
	0.7872528	0.3314311	0.3745009	2.1411438	2.4723520	0.8459766	0.6235320					
716	0.4035771	0.4035769	0.7165752	0.3084784	0.0936753	-0.5676628	-0.3665984	0.6613381	0.3271261	0.4908826	0.7853981	1.2849321
	0.7855030	0.3320171	0.3737462	2.1413126	2.4731054	0.8449020	0.6221134					
717	0.4026421	0.4026419	0.7158075	0.3074911	0.0933555	-0.5684711	-0.3670853	0.6618266	0.3273014	0.4908826	0.7853981	1.2836370
	0.7837540	0.3326047	0.3729891	2.1414814	2.4738607	0.8438271	0.6206953					
718	0.4017062	0.4017060	0.7150394	0.3065037	0.0930359	-0.5692787	-0.3675710	0.6623145	0.3274770	0.4908826	0.7853981	1.2823458
	0.7820029	0.3331933	0.3722301	2.1416521	2.4746180	0.8427523	0.6192760					
719	0.4007692	0.4007691	0.7142717	0.3055158	0.0927162	-0.5700787	-0.3680523	0.6627949	0.3276536	0.4908826	0.7853981	1.2810764
	0.7802503	0.3337838	0.3714685	2.1418228	2.4753809	0.8416781	0.6182551					
720	0.3998328	0.3998326	0.7135026	0.3045276	0.0923964	-0.5708833	-0.3685362	0.6632798	0.3278289	0.4908826	0.7853981	1.2797966
	0.7784979	0.3343752	0.3707052	2.1419954	2.4761429	0.8406029	0.6169351					
721	0.3989950	0.3989948	0.7127330	0.3035389	0.0920767	-0.5716875	-0.3690197	0.6637642	0.3280045	0.4908826	0.7853981	1.2785196
	0.7767437	0.3349679	0.3699397	2.1421680	2.4769077	0.8395277	0.6156132					
722	0.3979568	0.3979566	0.7119608	0.3025501	0.0917570	-0.5724915	-0.3695033	0.6642485	0.3281780	0.4908826	0.7853981	1.2772446
	0.7749884	0.3355609	0.3691730	2.1423416	2.4776735	0.8384505	0.6142936					
723	0.3970193	0.3970191	0.7111878	0.3015638	0.0914373	-0.5732971	-0.3699871	0.6647344	0.3283505	0.4908826	0.7853981	1.2759666
	0.7732344	0.3361553	0.3684043	2.1425161	2.4784403	0.8373728	0.6129691					
724	0.3960803	0.3960801	0.7104146	0.3005713	0.0911176	-0.5741001	-0.3704694	0.6652177	0.3285237	0.4908826	0.7853981	1.2746973
	0.7714782	0.3367509	0.3676334	2.1426907	2.4792099	0.8362954	0.6116456					
725	0.3951405	0.3951403	0.7096377	0.2995814	0.0907979	-0.5749022	-0.3709533	0.6657001	0.3286943	0.4908826	0.7853981	1.2734318
	0.7697198	0.3373463	0.3668618	2.1428671	2.4799805	0.8352149	0.6103207					
726	0.3942003	0.3942001	0.7088621	0.2985912	0.0904782	-0.5757021	-0.3714310	0.6661803	0.3288664	0.4908826	0.7853981	1.2721739
	0.7679605	0.3379437	0.3660873	2.1430445	2.4807549	0.8341360	0.6089954					
727	0.3932602	0.3932598	0.7080859	0.2976007	0.0901585	-0.5765061	-0.3719134	0.6666645	0.3290378	0.4908826	0.7853981	1.2709064
	0.7662019	0.3385426	0.3653105	2.1432219	2.4815302	0.8330508	0.6076702					
728	0.3923188	0.3923186	0.7073360	0.2966096	0.0898387	-0.5773075	-0.3723941	0.6671462	0.3292067	0.4908826	0.7853981	1.2696476
	0.7644406	0.3391416	0.3645327	2.1434011	2.4823065	0.8319746	0.6063434					
729	0.3913778	0.3913776	0.7065591	0.2956183	0.0895190	-0.5781061	-0.3728730	0.6676251	0.3293794	0.4908826	0.7853981	1.2683973
	0.7626805	0.3397438	0.3637510	2.1435804	2.4830885	0.8308966	0.6050172					
730	0.3904353	0.3904352	0.7057798	0.2946264	0.0891993	-0.5789065	-0.3733527	0.6681058	0.3295489	0.4908826	0.7853981	1.2671442
	0.7609168	0.3403456	0.3629684	2.1437616	2.4838705	0.8298147	0.6036888					
731	0.3894939	0.3894938	0.7049699	0.2936345	0.0888796	-0.5797091	-0.3738338	0.6685868	0.3297181	0.4908826	0.7853981	1.2658873
	0.7591558	0.3409493	0.3621836	2.1439428	2.4846525	0.8287337	0.6023602					
732	0.3885509	0.3885508	0.7041881	0.2926422	0.0885599	-0.5805085	-0.3743125	0.6690685	0.3298867	0.4908826	0.7853981	1.2646389
	0.7573916	0.3415533	0.3613971	2.1441250	2.4854343	0.8276513	0.6010329					
733	0.3876073	0.3876072	0.7034050	0.2916495	0.0882402	-0.5813080	-0.3747913	0.6695482	0.3300545	0.4908826	0.7853981	1.2633934
	0.7556264	0.3421586	0.3606087	2.1443081	2.4862161	0.8265679	0.5997030					
734	0.3866628	0.3866627	0.7026199	0.2906562	0.0879205	-0.5821071	-0.3752698	0.6700276	0.3302211	0.4908826	0.7853981	1.2621489
	0.7538595	0.3427647	0.3598184	2.1444921	2.4870157	0.8254831	0.5983719					
735	0.3857187	0.3857185	0.7018353	0.2896630	0.0876008	-0.5829056	-0.3757476	0.6705064	0.3303880	0.4908826	0.7853981	1.2609081
	0.7520932	0.3433722	0.3590260	2.1446772	2.4878073	0.8243994	0.5970412					
736	0.3847731	0.3847730	0.7010469	0.2886693	0.0872810	-0.5837039	-0.3762252	0.6709849	0.3305525	0.4908826	0.7853981	1.2596693
	0.7503242	0.3439796	0.3582324	2.1448631	2.4885988	0.8233124	0.5957066					
737	0.3838277	0.3838275	0.7002602	0.2876753	0.0869613	-0.5845013	-0.3767019	0.6714626	0.3307185	0.4908826	0.7853981	1.2584352
	0.7485555	0.3445895	0.3574356	2.1450503	2.4893904	0.8222273	0.5943762					
738	0.3828816	0.3828814	0.6994711	0.2866809	0.0866417	-0.5852990	-0.3771790	0.6719407	0.3308827	0.4908826	0.7853981	1.2572002
	0.7467854	0.3451993	0.3566375	2.1452379	2.4901824	0.8211434	0.5930528					
739	0.3819344	0.3819342	0.6986799	0.2856861	0.0863219	-0.5860958	-0.3776551	0.6724177	0.3310459	0.4908826	0.7853981	1.2559700
	0.7450135	0.3458109	0.3558375	2.1454268	2.4909741	0.8200520	0.5917303					
740	0.3809872	0.3809871	0.6978883	0.2846910	0.0860022	-0.5868919	-0.3781306	0.6728941	0.3312083	0.4908826	0.7853981	1.2547426
	0.7432413	0.3464230	0.3550354	2.1456165	2.4917657	0.8189532	0.5904031					
741	0.3800398	0.3800396	0.6970963	0.2836953	0.0856825	-0.5876857	-0.3786057	0.6733692	0.3313743	0.4908826	0.7853981	1.2535229
	0.7414688	0.3470386	0.3542247	2.1458073	2.4925585	0.8178479	0.5890880					
742	0.3790922	0.3790920	0.6963054	0.2826995	0.0853628	-0.5884787	-0.3790791	0.6738515	0.3315352	0.4908826	0.7853981	1.2522812
	0.7396963	0.3476532	0.3534229	2.1459990	2.4933515	0.8167381	0.5877524					
743	0.3780932	0.3780931	0.6955110	0.2817031	0.0850431	-0.5892728	-0.3795494	0.6743459	0.3317004	0.4908826	0.7853981	1.2516794
	0.7378271	0.3482593	0.3526173	2.1461921	2.4941446	0.8156283	0.5864166					
744	0.3771443	0.3771441	0.6947185	0.2807064	0.0847234	-0.5900675	-0.3799999	0.6748409	0.3318639	0.4908826	0.7853981	1.2504506
	0.7360519	0.3488778	0.3518016	2.1463957	2.4949381	0.8145186	0.5850778					
745	0.3761947	0.3761945	0.6939260	0.2797095	0.0844037	-0.5908621	-0.3804504	0.6753358	0.3320260	0.4908826	0.7853981	1.2492437
	0.7342754	0.3494977	0.3509874	2.1466032	2.4957317	0.8134214	0.5837477					
746	0.3752441	0.3752440	0.6931326	0.2787120	0.0840840	-0.5916567	-0.3809011	0.6758301	0.3321862	0.4908826	0.7853981	1.2480354
	0.7324967	0.3501169	0.3501723	2.1468167	2.4965251	0.8123130	0.5823862					
747	0.3742934	0.3742932	0.6923392	0.2777143	0.0837643	-0.5924512	-0.3813515	0.6763239	0.3323776	0.4908826	0.7853981	1.2468309
	0.7307183	0.3507386	0.3493572	2.1470431	2.4973184	0.8112033	0.5809931					

748	0.3733418	0.3733416	0.6915313	0.2747160	0.0834445	-0.5930091	-0.3817797	0.6764536	0.3325372	0.4908826	0.7853981	1.2456207
	0.7289382	0.3513606	0.3485339	2.1471806	2.4983835	0.8102478	0.5795997					
749	0.3723907	0.3723905	0.6907306	0.2757175	0.0831248	-0.5938068	-0.3822548	0.6769316	0.3326949	0.4908826	0.7853981	1.2444010
	0.7271585	0.3519838	0.3477119	2.1473799	2.4992027	0.8091546	0.5782596					
750	0.3714384	0.3714382	0.6899312	0.2747186	0.0828052	-0.5945967	-0.3827251	0.6774019	0.3328547	0.4908826	0.7853981	1.2432032
	0.7253772	0.3526090	0.3468869	2.1475792	2.5000277	0.8080629	0.5769178					
751	0.3704855	0.3704854	0.6891297	0.2737194	0.0824854	-0.5953914	-0.3831981	0.6778768	0.3330131	0.4908826	0.7853981	1.2419949
	0.7235945	0.3532349	0.3460601	2.1477804	2.5008526	0.8069697	0.5755753					
752	0.3695323	0.3695321	0.6883278	0.2727198	0.0821657	-0.5961809	-0.3836679	0.6783466	0.3331714	0.4908826	0.7853981	1.2408018
	0.7218110	0.3538625	0.3452307	2.1479826	2.5016823	0.8058766	0.5742322					
753	0.3685778	0.3685777	0.6875207	0.2717201	0.0818460	-0.5969722	-0.3841385	0.6788182	0.3333256	0.4908826	0.7853981	1.2396049
	0.7200253	0.3544890	0.3444011	2.1481857	2.5025110	0.8047792	0.5728474					
754	0.3676229	0.3676227	0.6867151	0.2707197	0.0815253	-0.5977537	-0.3846073	0.6792870	0.3334816	0.4908826	0.7853981	1.2384157
	0.7182388	0.3551180	0.3435682	2.1483898	2.5033336	0.8036833	0.5715020					
755	0.3666674	0.3666673	0.6859075	0.2697192	0.0812056	-0.5985539	-0.3850789	0.6797605	0.3336362	0.4908826	0.7853981	1.2372169
	0.7164513	0.3557476	0.3427331	2.1485949	2.5041771	0.8025862	0.5701459					
756	0.3657117	0.3657116	0.6850997	0.2687179	0.0808858	-0.5993718	-0.3855471	0.6802287	0.3337910	0.4908826	0.7853981	1.2360325
	0.7146635	0.3563792	0.3418959	2.1488008	2.5050144	0.8014891	0.5686894					
757	0.3647557	0.3647556	0.6842927	0.2677164	0.0805672	-0.6001338	-0.3860175	0.6807010	0.3339467	0.4908826	0.7853981	1.2348394
	0.7128752	0.3570127	0.3410545	2.1490078	2.5058537	0.8003933	0.5672326					
758	0.3637988	0.3637985	0.6834838	0.2667146	0.0802475	-0.6009207	-0.3864847	0.6811681	0.3341014	0.4908826	0.7853981	1.2336607
	0.7110849	0.3576469	0.3402119	2.1492167	2.5066967	0.7992962	0.5657644					
759	0.3628416	0.3628414	0.6826730	0.2657123	0.0799277	-0.6017073	-0.3869516	0.6816350	0.3342546	0.4908826	0.7853981	1.2324839
	0.7092940	0.3582821	0.3393670	2.1494265	2.5075407	0.7981977	0.5643063					
760	0.3618841	0.3618839	0.6818613	0.2647097	0.0796060	-0.6024982	-0.3874209	0.6821063	0.3344073	0.4908826	0.7853981	1.2312975
	0.7075026	0.3589187	0.3385199	2.1496372	2.5083866	0.7970989	0.5628571					
761	0.3609260	0.3609259	0.6810501	0.2637066	0.0792883	-0.6032841	-0.3878870	0.6825724	0.3345609	0.4908826	0.7853981	1.2301254
	0.7057108	0.3595550	0.3376697	2.1498489	2.5092363	0.7960008	0.5614074					
762	0.3599678	0.3599676	0.6802376	0.2627030	0.0789686	-0.6040769	-0.3883573	0.6830455	0.3347135	0.4908826	0.7853981	1.2289371
	0.7039176	0.3601964	0.3368171	2.1500616	2.5100861	0.7949020	0.5599485					
763	0.3590079	0.3590077	0.6794227	0.2616995	0.0786489	-0.6048613	-0.3888220	0.6835102	0.3348649	0.4908826	0.7853981	1.2277708
	0.7021220	0.3608366	0.3359632	2.1502752	2.5109406	0.7938015	0.5584793					
764	0.3580483	0.3580481	0.6786064	0.2606954	0.0783292	-0.6056483	-0.3892884	0.6839775	0.3350151	0.4908826	0.7853981	1.2265997
	0.7003259	0.3614771	0.3351069	2.1504909	2.5117960	0.7927002	0.5570031					
765	0.3570869	0.3570867	0.6777892	0.2596906	0.0780095	-0.6064304	-0.3897515	0.6844396	0.3351655	0.4908826	0.7853981	1.2254429
	0.6985279	0.3621203	0.3342477	2.1507072	2.5126553	0.7915983	0.5556943					
766	0.3561257	0.3561255	0.6769706	0.2586858	0.0776898	-0.6072165	-0.3902171	0.6849063	0.3353147	0.4908826	0.7853981	1.2242765
	0.6967297	0.3627633	0.3333866	2.1509247	2.5135155	0.7904956	0.5553452					
767	0.3551642	0.3551641	0.6761516	0.2576805	0.0773700	-0.6080022	-0.3906821	0.6853722	0.3354637	0.4908826	0.7853981	1.2231131
	0.6949308	0.3634088	0.3325220	2.1511440	2.5143765	0.7893931	0.5539911					
768	0.3542023	0.3542021	0.6753315	0.2566748	0.0770503	-0.6087902	-0.3911464	0.6858405	0.3356121	0.4908826	0.7853981	1.2219448
	0.6931314	0.3640552	0.3316565	2.1513634	2.5152435	0.7882898	0.5526361					
769	0.3532396	0.3532394	0.6745112	0.2556686	0.0767306	-0.6095750	-0.3916126	0.6863056	0.3357610	0.4908826	0.7853981	1.2207861
	0.6913304	0.3647035	0.3307871	2.1515846	2.5161114	0.7871869	0.5512801					
770	0.3522763	0.3522761	0.6736875	0.2546623	0.0764109	-0.6103570	-0.3920749	0.6867679	0.3359071	0.4908826	0.7853981	1.2196350
	0.6895290	0.3653514	0.3299167	2.1518078	2.5169821	0.7860814	0.5499235					
771	0.3513122	0.3513120	0.6728634	0.2536559	0.0760912	-0.6111407	-0.3925383	0.6872320	0.3360534	0.4908826	0.7853981	1.2184820
	0.6877245	0.3660309	0.3290434	2.1520309	2.5178537	0.7849759	0.5485655					
772	0.3503477	0.3503475	0.6720377	0.2526483	0.0757715	-0.6119273	-0.3930029	0.6876988	0.3361987	0.4908826	0.7853981	1.2173223
	0.6859201	0.3666515	0.3281679	2.1522560	2.5187283	0.7838693	0.5472071					
773	0.3493825	0.3493823	0.6712113	0.2516406	0.0754518	-0.6127132	-0.3934652	0.6881620	0.3363438	0.4908826	0.7853981	1.2161732
	0.6841143	0.3673034	0.3272884	2.1524820	2.5196026	0.7827625	0.5458477					
774	0.3484173	0.3484171	0.6703865	0.2506324	0.0751321	-0.6134911	-0.3939263	0.6886231	0.3364907	0.4908826	0.7853981	1.2150307
	0.6823087	0.3679585	0.3264375	2.1527090	2.5204778	0.7816576	0.5444883					
775	0.3474513	0.3474511	0.6695532	0.2496238	0.0748124	-0.6142735	-0.3943881	0.6890859	0.3366356	0.4908826	0.7853981	1.2138853
	0.6805015	0.3686145	0.3255232	2.1529379	2.5213709	0.7805510	0.5431276					
776	0.3464847	0.3464845	0.6687316	0.2486153	0.0744927	-0.6150534	-0.3948483	0.6895461	0.3367813	0.4908826	0.7853981	1.2127476
	0.6786932	0.3692710	0.3246363	2.1531677	2.5222578	0.7794445	0.5417666					
777	0.3455177	0.3455177	0.6679016	0.2476056	0.0741730	-0.6158350	-0.3953092	0.6900079	0.3369248	0.4908826	0.7853981	1.2116070
	0.6769829	0.3699285	0.3237475	2.1533995	2.5231457	0.7783362	0.5404040					
778	0.3445503	0.3445498	0.6670699	0.2465963	0.0738533	-0.6166160	-0.3957650	0.6904693	0.3370667	0.4908826	0.7853981	1.2104692
	0.6751733	0.3705870	0.3228565	2.1536322	2.5240355	0.7772269	0.5390429					
779	0.3435813	0.3435816	0.6662340	0.2455859	0.0735335	-0.6173971	-0.3962300	0.6909306	0.3372099	0.4908826	0.7853981	1.2093325
	0.6732620	0.3712476	0.3219671	2.1538658	2.5249290	0.7761183	0.5376785					
780	0.3426127	0.3426126	0.6654049	0.2445754	0.0732138	-0.6181776	-0.3966878	0.6913914	0.3373514	0.4908826	0.7853981	1.2081985
	0.6714490	0.3719088	0.3210656	2.1541014	2.5258245	0.7750031	0.5363139					
781	0.3416432	0.3416431	0.6645693	0.2435645	0.0728941	-0.6189578	-0.3971494	0.6918519	0.3374918	0.4908826	0.7853981	1.2070665
	0.6696351	0.3725710	0.3201669	2.1543379	2.5267220	0.7738965	0.5349496					
782	0.3406731	0.3406730	0.6637346	0.2425535	0.0725744	-0.6197374	-0.3976068	0.6923093	0.3376330	0.4908826	0.7853981	1.2059431
	0.6678205	0.3732351	0.3192649	2.1545753	2.5276241	0.7727862	0.5335826					
783	0.3397020	0.3397018	0.6628964	0.2415417	0.0722547	-0.6205142	-0.3980654	0.6927689	0.3377721	0.4908826	0.7853981	1.2048159
	0.6660036	0.3738497	0.3183613	2.1548147	2.5285273	0.7716731	0.5322151					

784	0.3387312	0.3387310	0.6620584	0.2405296	0.0719350	-0.6212952	-0.3985248	0.6932302	0.3379112	0.4908826	0.7853981	1.2036858
	0.6641876	0.3745661	0.3174539	2.1550550	2.5294323	0.7705607	0.5304483					
785	0.3377596	0.3377594	0.6612199	0.2395170	0.0716153	-0.6220738	-0.3989827	0.6936890	0.3380504	0.4908826	0.7853981	1.2025623
	0.6623698	0.3752343	0.3165438	2.1552973	2.5303411	0.7694484	0.5294802					
786	0.3367870	0.3367869	0.6603805	0.2385042	0.0712956	-0.6228496	-0.3994383	0.6941451	0.3381896	0.4908826	0.7853981	1.2014475
	0.6605505	0.3759034	0.3156313	2.1555405	2.5312536	0.7683358	0.5281109					
787	0.3358135	0.3358133	0.6595371	0.2374910	0.0709758	-0.6236271	-0.3998956	0.6946029	0.3383256	0.4908826	0.7853981	1.2003298
	0.6587290	0.3765728	0.3147173	2.1557856	2.5321674	0.7672199	0.5267431					
788	0.3348407	0.3348405	0.6586940	0.2364772	0.0706561	-0.6244069	-0.4003538	0.6950630	0.3384616	0.4908826	0.7853981	1.1992073
	0.6569091	0.3772442	0.3137994	2.1560316	2.5330830	0.7661046	0.5253705					
789	0.3338658	0.3338656	0.6578492	0.2354633	0.0703365	-0.6251789	-0.4008071	0.6955153	0.3385974	0.4908826	0.7853981	1.1981049
	0.6550851	0.3779161	0.3128797	2.1562796	2.5340033	0.7649885	0.5239978					
790	0.3328917	0.3328915	0.6570066	0.2344486	0.0700167	-0.6259574	-0.4012643	0.6959742	0.3387350	0.4908826	0.7853981	1.1969881
	0.6532629	0.3785914	0.3119553	2.1565285	2.5349264	0.7638748	0.5226255					
791	0.3319162	0.3319160	0.6561610	0.2334337	0.0696970	-0.6267314	-0.4017183	0.6964284	0.3388708	0.4908826	0.7853981	1.1958838
	0.6514378	0.3792669	0.3110292	2.1567793	2.5358524	0.7627588	0.5212532					
792	0.3309401	0.3309399	0.6553138	0.2324182	0.0693773	-0.6275009	-0.4021730	0.6968842	0.3390056	0.4908826	0.7853981	1.1947765
	0.6496118	0.3799437	0.3101003	2.1570311	2.5367804	0.7616419	0.5198784					
793	0.3299636	0.3299634	0.6544647	0.2314023	0.0690576	-0.6282797	-0.4026252	0.6973373	0.3391389	0.4908826	0.7853981	1.1936779
	0.6477849	0.3806215	0.3091689	2.1572847	2.5377111	0.7605236	0.5185043					
794	0.3289869	0.3289867	0.6536161	0.2303860	0.0687379	-0.6290591	-0.4030833	0.6977970	0.3392729	0.4908826	0.7853981	1.1925631
	0.6459575	0.3812992	0.3082342	2.1575403	2.5386438	0.7594063	0.5171294					
795	0.3280094	0.3280092	0.6527663	0.2293696	0.0684182	-0.6298291	-0.4035343	0.6982473	0.3394065	0.4908826	0.7853981	1.1914730
	0.6441288	0.3819823	0.3072969	2.1577969	2.5395813	0.7582886	0.5157534					
796	0.3270305	0.3270304	0.6519132	0.2283524	0.0680985	-0.6306052	-0.4039887	0.6987036	0.3395379	0.4908826	0.7853981	1.1903696
	0.6422977	0.3826634	0.3063572	2.1580544	2.5405197	0.7571680	0.5143754					
797	0.3260519	0.3260517	0.6510623	0.2273349	0.0677788	-0.6313741	-0.4044389	0.6991528	0.3396715	0.4908826	0.7853981	1.1892643
	0.6404665	0.3833475	0.3054135	2.1583147	2.5414639	0.7560562	0.5129978					
798	0.3250731	0.3250729	0.6502096	0.2263168	0.0674590	-0.6321499	-0.4048930	0.6996089	0.3398036	0.4908826	0.7853981	1.1881838
	0.6386355	0.3840330	0.3044669	2.1585751	2.5424089	0.7549312	0.5116200					
799	0.3240928	0.3240926	0.6493554	0.2252985	0.0671393	-0.6329202	-0.4053437	0.7000595	0.3399352	0.4908826	0.7853981	1.1870975
	0.6368015	0.3847193	0.3035178	2.1588383	2.5433578	0.7538113	0.5102403					
800	0.3231124	0.3231122	0.6484994	0.2242797	0.0668196	-0.6336949	-0.4057968	0.7005146	0.3400654	0.4908826	0.7853981	1.1860018
	0.6349675	0.3854066	0.3025661	2.1591024	2.5443077	0.7526903	0.5088603					
801	0.3221320	0.3221319	0.6476429	0.2232604	0.0664999	-0.6344668	-0.4062480	0.7009667	0.3401953	0.4908826	0.7853981	1.1849146
	0.6331332	0.3860959	0.3016110	2.1593685	2.5452614	0.7515693	0.5074804					
802	0.3211504	0.3211502	0.6467843	0.2222409	0.0661802	-0.6352435	-0.4067001	0.7014207	0.3403240	0.4908826	0.7853981	1.1838236
	0.6312971	0.3867857	0.3006537	2.1596355	2.5462170	0.7504470	0.5060989					
803	0.3201680	0.3201678	0.6459250	0.2212209	0.0658605	-0.6360095	-0.4071494	0.7018700	0.3404528	0.4908826	0.7853981	1.1827450
	0.6294588	0.3874769	0.2996932	2.1599054	2.5471773	0.7493245	0.5047162					
804	0.3191854	0.3191853	0.6450676	0.2202002	0.0655408	-0.6367779	-0.4075981	0.7023187	0.3405835	0.4908826	0.7853981	1.1816692
	0.6276206	0.3881714	0.2987280	2.1601763	2.5481424	0.7482043	0.5033334					
805	0.3182021	0.3182019	0.6442064	0.2191792	0.0652211	-0.6375504	-0.4080489	0.7027715	0.3407114	0.4908826	0.7853981	1.1805849
	0.6257812	0.3888657	0.2977613	2.1604481	2.5491076	0.7470812	0.5019495					
806	0.3172181	0.3172179	0.6433455	0.2181576	0.0649014	-0.6383225	-0.4084983	0.7032219	0.3408401	0.4908826	0.7853981	1.1795073
	0.6239401	0.3895622	0.2968906	2.1607227	2.5500774	0.7459587	0.5005647					
807	0.3162340	0.3162338	0.6424848	0.2171357	0.0645816	-0.6390880	-0.4089462	0.7036697	0.3409691	0.4908826	0.7853981	1.1784372
	0.6220989	0.3902608	0.2959165	2.1609983	2.5510511	0.7448372	0.4991798					
808	0.3152136	0.3152134	0.6416211	0.2161134	0.0642620	-0.6398675	-0.4093955	0.7039495	0.3411196	0.4908826	0.7853981	1.1777697
	0.6201901	0.3909494	0.2948402	2.1612854	2.5520373	0.7437133	0.4977436					
809	0.3142623	0.3142622	0.6407558	0.2150907	0.0639423	-0.6406232	-0.4098469	0.7045654	0.3412226	0.4908826	0.7853981	1.1763000
	0.6184104	0.3916593	0.2938609	2.1615553	2.5530052	0.7425836	0.4964053					
810	0.3132417	0.3132415	0.6398886	0.2140675	0.0636225	-0.6413825	-0.4103002	0.7048451	0.3413712	0.4908826	0.7853981	1.1756334
	0.6165009	0.3923509	0.2928785	2.1618462	2.5540581	0.7414635	0.4949691					
811	0.3122539	0.3122537	0.6390211	0.2130438	0.0633028	-0.6421465	-0.4107536	0.7052913	0.3414960	0.4908826	0.7853981	1.1745710
	0.6146529	0.3930531	0.2918932	2.1621294	2.5550432	0.7403370	0.4935791					
812	0.3112664	0.3112662	0.6381569	0.2120197	0.0629831	-0.6429155	-0.4112068	0.7057366	0.3416225	0.4908826	0.7853981	1.1735115
	0.6128055	0.3937582	0.2909077	2.1624136	2.5560331	0.7392128	0.4921846					
813	0.3102791	0.3102789	0.6372871	0.2109951	0.0626634	-0.6436932	-0.4116594	0.7061866	0.3417476	0.4908826	0.7853981	1.1724434
	0.6109585	0.3944645	0.2899112	2.1626997	2.5570240	0.7380880	0.4907835					
814	0.3092896	0.3092895	0.6364143	0.2099704	0.0623437	-0.6444705	-0.4121114	0.7066412	0.3418700	0.4908826	0.7853981	1.1713877
	0.6091075	0.3951703	0.2889171	2.1629877	2.5580177	0.7369555	0.4893744					
815	0.3083005	0.3083003	0.6355437	0.2089450	0.0620240	-0.6452496	-0.4125624	0.7071076	0.3419935	0.4908826	0.7853981	1.1703291
	0.6072569	0.3958793	0.2879146	2.1632776	2.5590153	0.7358144	0.4879567					
816	0.3073102	0.3073100	0.6346695	0.2079191	0.0617043	-0.6460314	-0.4130150	0.7075836	0.3421149	0.4908826	0.7853981	1.1692724
	0.6054043	0.3965881	0.2869175	2.1635695	2.5600157	0.7346737	0.4865295					
817	0.3063198	0.3063196	0.6337959	0.2068932	0.0613846	-0.6468150	-0.4134689	0.7079675	0.3422371	0.4908826	0.7853981	1.1682224
	0.6035513	0.3972992	0.2859178	2.1638632	2.5610194	0.7335350	0.4850931					
818	0.3053294	0.3053282	0.6329211	0.2058660	0.0610648	-0.6475997	-0.4139219	0.7084106	0.3423590	0.4908826	0.7853981	1.1671753
	0.6016966	0.3980117	0.2849047	2.1641588	2.5620279	0.7323961	0.4836553					
819	0.3043364	0.3043362	0.6320463	0.2048388	0.0607451	-0.6483845	-0.4143743	0.7088556	0.3424792	0.4908826	0.7853981	1.1661243
	0.5998406	0.3987252	0.2838834	2.1644564	2.5630377	0.7312573	0.4822168					

820	0.3033445	0.3033443	0.6311666	0.2038112	0.0604254	-0.6488746	-0.4146396	0.7093000	0.3425992	0.4908826	0.7853981	1.1650772
	0.5979848	0.3994404	0.2828794	2.1647558	2.5640516	0.7301874	0.4810445					
821	0.3023511	0.3023509	0.6302879	0.2027832	0.0601057	-0.6496364	-0.4150416	0.7097422	0.3427186	0.4908826	0.7853981	1.1640348
	0.5961265	0.4001566	0.2818618	2.1650572	2.5650692	0.7290571	0.4796472					
822	0.3013579	0.3013577	0.6294036	0.2017546	0.0597860	-0.6504000	-0.4155245	0.7101861	0.3428390	0.4908826	0.7853981	1.1629896
	0.5942681	0.4008752	0.2808402	2.1653605	2.5660896	0.7279276	0.4782500					
823	0.3003635	0.3003633	0.6285272	0.2007756	0.0594653	-0.6511555	-0.4159684	0.7106318	0.3429563	0.4908826	0.7853981	1.1619415
	0.5924078	0.4015937	0.2798163	2.1656656	2.5671120	0.7267950	0.4768513					
824	0.2993682	0.2993680	0.6276447	0.1996961	0.0591456	-0.6519299	-0.4164090	0.7110724	0.3430742	0.4908826	0.7853981	1.1609068
	0.5905463	0.4023142	0.2787886	2.1659727	2.5681400	0.7256629	0.4754514					
825	0.2983732	0.2983730	0.6267616	0.1986662	0.0588269	-0.6526906	-0.4168521	0.7115175	0.3431914	0.4908826	0.7853981	1.1598625
	0.5886846	0.4030362	0.2777575	2.1662817	2.5691690	0.7245309	0.4740523					
826	0.2973765	0.2973763	0.6258763	0.1976358	0.0585071	-0.6534481	-0.4172709	0.7119552	0.3433078	0.4908826	0.7853981	1.1586364
	0.5867199	0.4037591	0.2767233	2.1665926	2.5702018	0.7233973	0.4726500					
827	0.2963796	0.2963794	0.6249840	0.1966054	0.0581875	-0.6542091	-0.4177313	0.7123966	0.3434215	0.4908826	0.7853981	1.1578326
	0.5847547	0.4044821	0.2756869	2.1669064	2.5712395	0.7222617	0.4711440					
828	0.2953821	0.2953820	0.6241020	0.1955739	0.0578678	-0.6549663	-0.4181707	0.7128360	0.3435380	0.4908826	0.7853981	1.1567745
	0.5830886	0.4052089	0.2746459	2.1672250	2.5722609	0.7211288	0.4696452					
829	0.2943841	0.2943839	0.6232142	0.1945621	0.0575480	-0.6557311	-0.4186119	0.7132792	0.3436533	0.4908826	0.7853981	1.1557388
	0.5812217	0.4059362	0.2736030	2.1675386	2.5733242	0.7199948	0.4680416					
830	0.2933858	0.2933856	0.6223264	0.1935099	0.0572283	-0.6564913	-0.4190514	0.7137196	0.3437684	0.4908826	0.7853981	1.1547108
	0.5793541	0.4066657	0.2725512	2.1678581	2.5743723	0.7188615	0.4670378					
831	0.2923866	0.2923864	0.6214346	0.1924772	0.0569088	-0.6572511	-0.4194905	0.7141597	0.3438813	0.4908826	0.7853981	1.1536846
	0.5774845	0.4073954	0.2714998	2.1681805	2.5754223	0.7177251	0.4656327					
832	0.2913868	0.2913866	0.6205454	0.1914439	0.0565889	-0.6580083	-0.4199280	0.7145972	0.3439970	0.4908826	0.7853981	1.1526651
	0.5756142	0.4081280	0.2704435	2.1685038	2.5764790	0.7165917	0.4642268					
833	0.2903856	0.2903854	0.6196489	0.1904106	0.0562692	-0.6587678	-0.4203668	0.7150369	0.3441064	0.4908826	0.7853981	1.1516418
	0.5737411	0.4088588	0.2693865	2.1688299	2.5775347	0.7154521	0.4628195					
834	0.2893844	0.2893842	0.6187550	0.1893765	0.0559495	-0.6595259	-0.4208043	0.7154754	0.3442187	0.4908826	0.7853981	1.1506224
	0.5718682	0.4095923	0.2683292	2.1691580	2.5785961	0.7143157	0.4614113					
835	0.2883828	0.2883826	0.6178612	0.1883420	0.0556298	-0.6602820	-0.4212437	0.7159118	0.3443313	0.4908826	0.7853981	1.1496086
	0.5699942	0.4103260	0.2672578	2.1694889	2.5796623	0.7131800	0.4600030					
836	0.2873809	0.2873799	0.6169632	0.1873069	0.0553101	-0.6610398	-0.4216779	0.7163499	0.3444410	0.4908826	0.7853981	1.1485920
	0.5681180	0.4110652	0.2661868	2.1698217	2.5807304	0.7120410	0.4585931					
837	0.2863769	0.2863767	0.6160652	0.1862714	0.0549904	-0.6617973	-0.4221147	0.7167876	0.3445510	0.4908826	0.7853981	1.1475773
	0.5662414	0.4118033	0.2651157	2.1701565	2.5818033	0.7109026	0.4571829					
838	0.2853728	0.2853728	0.6151661	0.1852356	0.0546706	-0.6625544	-0.4225512	0.7172251	0.3446606	0.4908826	0.7853981	1.1465645
	0.5643635	0.4125427	0.2640392	2.1704931	2.5828781	0.7097638	0.4557713					
839	0.2843688	0.2843687	0.6142672	0.1841990	0.0543509	-0.6633110	-0.4229875	0.7176619	0.3447707	0.4908826	0.7853981	1.1455536
	0.5624850	0.4132842	0.2629582	2.1708326	2.5839586	0.7086260	0.4543598					
840	0.2833646	0.2833645	0.6133685	0.1831622	0.0540313	-0.6640647	-0.4234211	0.7180960	0.3448812	0.4908826	0.7853981	1.1445513
	0.5606059	0.4140275	0.2618733	2.1711750	2.5850430	0.7074891	0.4529481					
841	0.2823583	0.2823582	0.6124639	0.1821249	0.0537115	-0.6648208	-0.4238565	0.7185323	0.3449874	0.4908826	0.7853981	1.1435432
	0.5587234	0.4147701	0.2607864	2.1715193	2.5861292	0.7063472	0.4515330					
842	0.2813519	0.2813515	0.6115531	0.1810870	0.0533918	-0.6655762	-0.4242913	0.7189680	0.3450931	0.4908826	0.7853981	1.1425381
	0.5568402	0.4155142	0.2596955	2.1718655	2.5872192	0.7052049	0.4501184					
843	0.2803443	0.2803444	0.6106537	0.1800488	0.0530721	-0.6663313	-0.4247257	0.7194034	0.3452004	0.4908826	0.7853981	1.1415348
	0.5549562	0.4162604	0.2586042	2.1722145	2.5883141	0.7040646	0.4487029					
844	0.2793372	0.2793370	0.6097479	0.1790099	0.0527524	-0.6670836	-0.4251583	0.7198360	0.3453067	0.4908826	0.7853981	1.1405392
	0.5530713	0.4170084	0.2575099	2.1725664	2.5894127	0.7029237	0.4472870					
845	0.2783288	0.2783287	0.6088409	0.1779705	0.0524327	-0.6678379	-0.4255918	0.7202705	0.3454129	0.4908826	0.7853981	1.1395397
	0.5511848	0.4177576	0.2563978	2.1729202	2.5905151	0.7017823	0.4458697					
846	0.2773198	0.2773197	0.6079330	0.1769310	0.0521130	-0.6685938	-0.4260262	0.7207068	0.3455157	0.4908826	0.7853981	1.1385374
	0.5492974	0.4185066	0.2552924	2.1732759	2.5916185	0.7006434	0.4444517					
847	0.2763101	0.2763099	0.6070197	0.1758907	0.0517933	-0.6693449	-0.4264626	0.7211382	0.3456195	0.4908826	0.7853981	1.1375415
	0.5474082	0.4192577	0.2541821	2.1736355	2.5927246	0.6994950	0.4430325					
848	0.2752997	0.2752996	0.6061086	0.1748501	0.0514736	-0.6701001	-0.4268991	0.7215717	0.3457232	0.4908826	0.7853981	1.1365538
	0.5455180	0.4200109	0.2530679	2.1739969	2.5938425	0.6983519	0.4416127					
849	0.2742882	0.2742881	0.6051934	0.1738099	0.0511538	-0.6708508	-0.4273221	0.7220047	0.3458239	0.4908826	0.7853981	1.1355619
	0.5436256	0.4207636	0.2519507	2.1743612	2.5949763	0.6972056	0.4401912					
850	0.2732764	0.2732763	0.6042801	0.1727672	0.0508341	-0.6716026	-0.4277535	0.7224367	0.3459269	0.4908826	0.7853981	1.1345750
	0.5417330	0.4215192	0.2508284	2.1747274	2.5960796	0.6960616	0.4387695					
851	0.2722646	0.2722645	0.6033665	0.1717250	0.0505144	-0.6723544	-0.4281844	0.7228668	0.3460298	0.4908826	0.7853981	1.1335850
	0.5398400	0.4222766	0.2497029	2.1750965	2.5972052	0.6949186	0.4373477					
852	0.2712515	0.2712514	0.6024496	0.1706822	0.0501947	-0.6731060	-0.4286153	0.7232907	0.3461304	0.4908826	0.7853981	1.1325989
	0.5379447	0.4230344	0.2485721	2.1754684	2.5983343	0.6937729	0.4359242					
853	0.2702385	0.2702384	0.6015345	0.1696392	0.0498750	-0.6738545	-0.4290441	0.7237145	0.3462328	0.4908826	0.7853981	1.1316204
	0.5360494	0.4237946	0.2474376	2.1758432	2.5994682	0.6926296	0.4345033					
854	0.2692240	0.2692239	0.6006168	0.1685955	0.0495553	-0.6746031	-0.4294730	0.7241384	0.3463340	0.4908826	0.7853981	1.1306429
	0.5341513	0.4245557	0.2462991	2.1762209	2.6006069	0.6914868	0.4330753					
855	0.2682093	0.2682093	0.5996962	0.1675512	0.0492356	-0.6753553	-0.4299036	0.7245906	0.3464329	0.4908826	0.7853981	1.1296577
	0.5322526	0.4253175	0.2451572	2.1766005	2.6017475	0.6903379	0.4316405					

856	0.2671942	0.2671940	0.5987770	0.1665065	0.0484159	-0.5761073	-0.4303363	0.7250232	0.3465329	0.4908826	0.7853981	1.1286745
	0.5303541	0.4263815	0.2440106	2.1769829	2.6028919	0.6891930	0.4302239					
857	0.2661778	0.2661777	0.5978548	0.1654614	0.0485961	-0.5768541	-0.4307611	0.7254503	0.3466313	0.4908826	0.7853981	1.1277037
	0.5284525	0.4268461	0.2438604	2.1773691	2.6040421	0.6883461	0.4287761					
858	0.2651605	0.2651604	0.5969299	0.1644158	0.0482764	-0.5776010	-0.4311882	0.7258774	0.3467280	0.4908826	0.7853981	1.1267338
	0.5265494	0.4276113	0.2417066	2.1777573	2.6051960	0.6868974	0.4273670					
859	0.2641168	0.2641166	0.5960034	0.1633699	0.0479568	-0.5782203	-0.4315423	0.7261771	0.3468409	0.4908826	0.7853981	1.1260538
	0.5245966	0.4283673	0.2405492	2.1781588	2.6064072	0.6857479	0.4259009					
860	0.2631236	0.2631235	0.5950764	0.1623233	0.0476370	-0.5790951	-0.4323421	0.7267322	0.3469197	0.4908826	0.7853981	1.1247959
	0.5227388	0.4291452	0.2393873	2.1785431	2.6075144	0.6845987	0.4246059					
861	0.2620793	0.2620792	0.5941488	0.1612761	0.0473173	-0.5797164	-0.4329370	0.7270337	0.3470322	0.4908826	0.7853981	1.1241131
	0.5207849	0.4299047	0.2382203	2.1789503	2.6087341	0.6834498	0.4233041					
862	0.2610590	0.2610589	0.5932189	0.1602285	0.0469976	-0.5804612	-0.4338220	0.7274588	0.3471266	0.4908826	0.7853981	1.1231518
	0.5188763	0.4306746	0.2370499	2.1793509	2.6099052	0.6822993	0.4219063					
863	0.2601378	0.2601377	0.5922857	0.1591805	0.0466779	-0.5812085	-0.4332487	0.7278864	0.3472185	0.4908826	0.7853981	1.1221848
	0.5169657	0.4314449	0.2358760	2.1797543	2.6110763	0.6811466	0.4201720					
864	0.2590162	0.2590160	0.5913517	0.1581320	0.0463582	-0.5819531	-0.4338735	0.7283112	0.3473104	0.4908826	0.7853981	1.1212254
	0.5150545	0.4322167	0.2346978	2.1801605	2.6122561	0.6799940	0.4187373					
865	0.2579940	0.2579939	0.5904160	0.1570829	0.0460384	-0.5826988	-0.4340986	0.7287372	0.3474008	0.4908826	0.7853981	1.1202641
	0.5131419	0.4329897	0.2335153	2.1805706	2.6134377	0.6788403	0.4173319					
866	0.2569718	0.2569717	0.5894843	0.1560333	0.0457188	-0.5834424	-0.4345225	0.7291611	0.3474955	0.4908826	0.7853981	1.1193085
	0.5112296	0.4337660	0.2323267	2.1809826	2.6146259	0.6776916	0.4158065					
867	0.2559489	0.2559488	0.5885507	0.1549830	0.0453991	-0.5841857	-0.4349661	0.7295848	0.3475888	0.4908826	0.7853981	1.1183548
	0.5093159	0.4345436	0.2311337	2.1813984	2.6158190	0.6765417	0.4144303					
868	0.2549255	0.2549254	0.5876157	0.1539323	0.0450794	-0.5849349	-0.4353728	0.7300143	0.3476812	0.4908826	0.7853981	1.1173887
	0.5074013	0.4353222	0.2299365	2.1818171	2.6170139	0.6753913	0.4129934					
869	0.2539012	0.2539011	0.5866783	0.1528811	0.0447596	-0.5856772	-0.4357954	0.7304369	0.3477723	0.4908826	0.7853981	1.1164389
	0.5054850	0.4361015	0.2287353	2.1822386	2.6182146	0.6742396	0.4115552					
870	0.2528755	0.2528754	0.5857389	0.1518294	0.0444399	-0.5864190	-0.4362174	0.7308589	0.3478624	0.4908826	0.7853981	1.1154919
	0.5035661	0.4368815	0.2275300	2.1826639	2.6194201	0.6730866	0.4101152					
871	0.2518496	0.2518495	0.5847985	0.1507772	0.0441202	-0.5871632	-0.4366439	0.7312834	0.3479519	0.4908826	0.7853981	1.1145391
	0.5016469	0.4376630	0.2263200	2.1830921	2.6206293	0.6719316	0.4086750					
872	0.2508236	0.2508234	0.5838580	0.1497245	0.0438005	-0.5879062	-0.4370633	0.7317067	0.3480415	0.4908826	0.7853981	1.1135902
	0.4997272	0.4384459	0.2251055	2.1835241	2.6218424	0.6707814	0.4072347					
873	0.2497960	0.2497959	0.5829144	0.1486713	0.0434808	-0.5886466	-0.4374840	0.7321274	0.3481293	0.4908826	0.7853981	1.1126480
	0.4978049	0.4392294	0.2238868	2.1839590	2.6230612	0.6696270	0.4057923					
874	0.2487683	0.2487682	0.5819703	0.1476175	0.0431611	-0.5893893	-0.4379061	0.7325504	0.3482170	0.4908826	0.7853981	1.1117020
	0.4958822	0.4400144	0.2226632	2.1843977	2.6242838	0.6684731	0.4043498					
875	0.2477392	0.2477391	0.5810228	0.1465634	0.0428414	-0.5901315	-0.4383275	0.7329729	0.3483022	0.4908826	0.7853981	1.1107578
	0.4939569	0.4407994	0.2214361	2.1848402	2.6255102	0.6673166	0.4029055					
876	0.2467096	0.2467095	0.5800767	0.1455085	0.0425217	-0.5908711	-0.4387474	0.7333927	0.3483894	0.4908826	0.7853981	1.1098204
	0.4920308	0.4415869	0.2202032	2.1852856	2.6267433	0.6661624	0.4014605					
877	0.2456800	0.2456799	0.5791314	0.1444536	0.0422019	-0.5916124	-0.4391681	0.7338144	0.3484777	0.4908826	0.7853981	1.1088800
	0.4901047	0.4423764	0.2189646	2.1857338	2.6279692	0.6650059	0.4000155					
878	0.2446491	0.2446489	0.5781814	0.1433973	0.0418823	-0.5923510	-0.4395871	0.7342333	0.3485623	0.4908826	0.7853981	1.1079464
	0.4881759	0.4431651	0.2177234	2.1861868	2.6292219	0.6638538	0.3985689					
879	0.2436178	0.2436177	0.5772325	0.1423409	0.0415626	-0.5930913	-0.4400067	0.7346539	0.3486484	0.4908826	0.7853981	1.1070099
	0.4862467	0.4439564	0.2164761	2.1866426	2.6304684	0.6626996	0.3971218					
880	0.2425858	0.2425857	0.5762806	0.1412840	0.0412428	-0.6938316	-0.4404253	0.7350745	0.3487323	0.4908826	0.7853981	1.1060743
	0.4843159	0.4447478	0.2152249	2.1871023	2.6317186	0.6615434	0.3956736					
881	0.2415525	0.2415524	0.5753201	0.1402265	0.0409231	-0.6945715	-0.4408435	0.7354946	0.3488147	0.4908826	0.7853981	1.1051407
	0.4823827	0.4455398	0.2139642	2.1875668	2.6329737	0.6603857	0.3942240					
882	0.2405194	0.2405193	0.5743738	0.1391685	0.0406034	-0.6953046	-0.4412627	0.7359123	0.3488994	0.4908826	0.7853981	1.1042137
	0.4804501	0.4463344	0.2127076	2.1880331	2.6342344	0.6592239	0.3927745					
883	0.2394855	0.2394854	0.5734203	0.1381099	0.0402837	-0.6960370	-0.4416806	0.7363307	0.3489830	0.4908826	0.7853981	1.1032848
	0.4785158	0.4471294	0.2114413	2.1884992	2.6355000	0.6580757	0.3913249					
884	0.2384507	0.2384506	0.5724642	0.1370508	0.0399640	-0.6967660	-0.4420983	0.7367454	0.3490657	0.4908826	0.7853981	1.1023560
	0.4765798	0.4479260	0.2101703	2.1889791	2.6367702	0.6569195	0.3898724					
885	0.2374148	0.2374147	0.5715063	0.1359915	0.0396443	-0.6974918	-0.4425149	0.7371659	0.3491471	0.4908826	0.7853981	1.1014347
	0.4746418	0.4487224	0.2088951	2.1894679	2.6380353	0.6557621	0.3884194					
886	0.2363791	0.2363790	0.5705487	0.1349313	0.0393246	-0.6982161	-0.4429317	0.7375836	0.3492291	0.4908826	0.7853981	1.1005106
	0.4727041	0.4495203	0.2076142	2.1899605	2.6393291	0.6546060	0.3869665					
887	0.2353423	0.2353421	0.5695893	0.1338705	0.0390039	-0.6989387	-0.4433477	0.7380036	0.3493100	0.4908826	0.7853981	1.0995827
	0.4707645	0.4503202	0.2063294	2.1904568	2.6405844	0.6534491	0.3855124					
888	0.2343044	0.2343043	0.5686249	0.1328083	0.0386851	-0.6996614	-0.4437647	0.7384186	0.3493901	0.4908826	0.7853981	1.0986662
	0.4688228	0.4511200	0.2050383	2.1909570	2.6418404	0.6522912	0.3840584					
889	0.2332659	0.2332658	0.5676638	0.1317477	0.0383659	-0.7003842	-0.4441813	0.7388376	0.3494679	0.4908826	0.7853981	1.0977421
	0.4668831	0.4519203	0.2037433	2.1914623	2.6430957	0.6511317	0.3826035					
890	0.2322267	0.2322266	0.5666993	0.1306854	0.0380457	-0.7010959	-0.4445968	0.7392516	0.3495462	0.4908826	0.7853981	1.0968294
	0.4649358	0.4527215	0.2024424	2.1919717	2.6443501	0.6499721	0.3811432					
891	0.2311867	0.2311866	0.5657324	0.1296224	0.0377260	-0.7018076	-0.4450111	0.7396678	0.3496227	0.4908826	0.7853981	1.0959129
	0.4629900	0.4535232	0.2011381	2.1924864	2.6456044	0.6488125	0.3796765					

892	0.2301458	0.2301457	0.5647637	0.1285595	0.0374063	-0.7026745	-0.4454241	0.7400808	0.3496582	0.4908826	0.7853981	1.0950050
	0.4613427	0.4553257	0.1998282	2.1929216	2.6471062	0.6476516	0.3782255					
893	0.2291041	0.2291040	0.5637953	0.1274956	0.0373866	-0.7034095	-0.4458384	0.7404961	0.3497748	0.4908826	0.7853981	1.0940914
	0.4590940	0.4551296	0.1985127	2.1934328	2.6486213	0.6464918	0.3767650					
894	0.2280621	0.2280622	0.5628272	0.1264310	0.0367669	-0.7041419	-0.4462510	0.7409087	0.3498519	0.4908826	0.7853981	1.0931854
	0.4571450	0.4559352	0.1971913	2.1939487	2.6477421	0.6453332	0.3753048					
895	0.2270194	0.2270193	0.5618553	0.1253662	0.0364472	-0.7048758	-0.4466643	0.7413230	0.3499262	0.4908826	0.7853981	1.0922766
	0.4551938	0.4567403	0.1958658	2.1944695	2.6510668	0.6441721	0.3738427					
896	0.2259753	0.2259752	0.5608819	0.1243036	0.0361274	-0.7056098	-0.4470776	0.7417372	0.3500002	0.4908826	0.7853981	1.0913687
	0.4532405	0.4575462	0.1945350	2.1949940	2.6523972	0.6430105	0.3723790					
897	0.2249312	0.2249311	0.5599098	0.1232345	0.0358077	-0.7063426	-0.4474897	0.7421503	0.3500745	0.4908826	0.7853981	1.0904636
	0.4512872	0.4583536	0.1931944	2.1955233	2.6537323	0.6418503	0.3709155					
898	0.2238869	0.2238868	0.5589335	0.1221681	0.0354881	-0.7070755	-0.4479021	0.7425636	0.3501474	0.4908826	0.7853981	1.0895596
	0.4493321	0.4591612	0.1918571	2.1960573	2.6550732	0.6406889	0.3694513					
899	0.2228401	0.2228400	0.5579547	0.1211010	0.0351683	-0.7078056	-0.4483124	0.7429739	0.3502179	0.4908826	0.7853981	1.0886621
	0.4473748	0.4599686	0.1905152	2.1965961	2.6564188	0.6394252	0.3679850					
900	0.2217942	0.2217941	0.5569769	0.1200332	0.0348486	-0.7085358	-0.4486689	0.7432885	0.3503027	0.4908826	0.7853981	1.0879755
	0.4453809	0.4607677	0.1891587	2.1971493	2.6578151	0.6381635	0.3664714					
901	0.2207267	0.2207265	0.5559983	0.1189649	0.0345289	-0.7091694	-0.4490787	0.7436983	0.3503747	0.4908826	0.7853981	1.0870810
	0.4434210	0.4615775	0.1878007	2.1976976	2.6591711	0.6372020	0.3650235					
902	0.2196782	0.2196783	0.5550102	0.1178961	0.0342092	-0.7099006	-0.4494892	0.7441097	0.3504441	0.4908826	0.7853981	1.0861835
	0.4414597	0.4623870	0.1864381	2.1982498	2.6605330	0.6360383	0.3635545					
903	0.2186297	0.2186296	0.5540364	0.1168266	0.0338895	-0.7106317	-0.4498997	0.7445211	0.3505160	0.4908826	0.7853981	1.0852871
	0.4394981	0.4631984	0.1850649	2.1988077	2.6619015	0.6348778	0.3620856					
904	0.2175804	0.2175803	0.5530627	0.1157569	0.0335698	-0.7113596	-0.4503079	0.7449294	0.3505847	0.4908826	0.7853981	1.0843983
	0.4375150	0.4640097	0.1836954	2.1993704	2.6632748	0.6337147	0.3606156					
905	0.2165299	0.2165298	0.5520678	0.1146863	0.0332501	-0.7120919	-0.4507186	0.7453420	0.3506533	0.4908826	0.7853981	1.0835009
	0.4355698	0.4648215	0.1823158	2.1999378	2.6646528	0.6325514	0.3591442					
906	0.2154788	0.2154787	0.5510812	0.1136152	0.0329304	-0.7128195	-0.4511265	0.7457498	0.3507208	0.4908826	0.7853981	1.0826149
	0.4336032	0.4656337	0.1809306	2.2005110	2.6660376	0.6313875	0.3576719					
907	0.2144279	0.2144269	0.5500945	0.1125435	0.0326107	-0.7135466	-0.4515339	0.7461573	0.3507889	0.4908826	0.7853981	1.0817308
	0.4316354	0.4664469	0.1795397	2.2010889	2.6674240	0.6302240	0.3561988					
908	0.2133747	0.2133746	0.5491068	0.1114712	0.0322909	-0.7142754	-0.4519423	0.7465663	0.3508565	0.4908826	0.7853981	1.0808430
	0.4296669	0.4672607	0.1781430	2.2016716	2.6688242	0.6290619	0.3547231					
909	0.2123215	0.2123213	0.5481167	0.1103985	0.0319712	-0.7150033	-0.4523493	0.7469751	0.3509226	0.4908826	0.7853981	1.0799570
	0.4276965	0.4680742	0.1767411	2.2022610	2.6702251	0.6278981	0.3532503					
910	0.2112678	0.2112677	0.5471274	0.1093253	0.0316516	-0.7157318	-0.4527571	0.7473834	0.3509898	0.4908826	0.7853981	1.0790730
	0.4257254	0.4688893	0.1753328	2.2028532	2.6716328	0.6267361	0.3517749					
911	0.2102129	0.2102127	0.5461337	0.1082513	0.0313318	-0.7164574	-0.4531630	0.7477893	0.3510540	0.4908826	0.7853981	1.0781946
	0.4237515	0.4697030	0.1739194	2.2034531	2.6730461	0.6255710	0.3502979					
912	0.2091572	0.2091571	0.5451385	0.1071768	0.0310121	-0.7171850	-0.4535683	0.7481971	0.3511173	0.4908826	0.7853981	1.0773134
	0.4217767	0.4705173	0.1725004	2.2040577	2.6744642	0.6244055	0.3488201					
913	0.2081016	0.2081015	0.5441444	0.1061017	0.0306924	-0.7179117	-0.4539735	0.7486036	0.3511837	0.4908826	0.7853981	1.0764351
	0.4198020	0.4713337	0.1710742	2.2046671	2.6758890	0.6232442	0.3473424					
914	0.2070444	0.2070442	0.5431486	0.1050261	0.0303727	-0.7186380	-0.4543786	0.7490107	0.3512460	0.4908826	0.7853981	1.0755568
	0.4178239	0.4721485	0.1696433	2.2052832	2.6773195	0.6220785	0.3458624					
915	0.2059866	0.2059865	0.5421508	0.1039498	0.0300530	-0.7193621	-0.4547860	0.7494151	0.3513087	0.4908826	0.7853981	1.0746851
	0.4158450	0.4729639	0.1682063	2.2059053	2.6787558	0.6209139	0.3443820					
916	0.2049279	0.2049278	0.5411515	0.1028730	0.0297332	-0.7200875	-0.4551907	0.7498208	0.3513707	0.4908826	0.7853981	1.0738115
	0.4138644	0.4737794	0.1667632	2.2065325	2.6801987	0.6197491	0.3429005					
917	0.2038694	0.2038693	0.5401530	0.1017958	0.0294136	-0.7208107	-0.4555942	0.7502242	0.3514336	0.4908826	0.7853981	1.0729427
	0.4118840	0.4745959	0.1653138	2.2071657	2.6816473	0.6185863	0.3414192					
918	0.2028094	0.2028093	0.5391505	0.1007178	0.0290939	-0.7215375	-0.4559994	0.7506313	0.3514939	0.4908826	0.7853981	1.0720673
	0.4099010	0.4754114	0.1638590	2.2078047	2.6831007	0.6174208	0.3399361					
919	0.2017490	0.2017488	0.5381487	0.0996393	0.0287741	-0.7222599	-0.4564021	0.7510340	0.3515552	0.4908826	0.7853981	1.0712023
	0.4079171	0.4762277	0.1623974	2.2084503	2.6845617	0.6162571	0.3384525					
920	0.2006872	0.2006871	0.5371435	0.0985602	0.0284544	-0.7229830	-0.4568054	0.7514383	0.3516144	0.4908826	0.7853981	1.0703344
	0.4059308	0.4770437	0.1609303	2.2091017	2.6860285	0.6150913	0.3369672					
921	0.1996248	0.1996247	0.5361370	0.0974804	0.0281347	-0.7237079	-0.4572087	0.7518426	0.3516733	0.4908826	0.7853981	1.0694675
	0.4039431	0.4778587	0.1594570	2.2097597	2.6875016	0.6139255	0.3354810					
922	0.1985615	0.1985614	0.5351293	0.0964001	0.0278150	-0.7244290	-0.4576101	0.7522440	0.3517311	0.4908826	0.7853981	1.0686073
	0.4019537	0.4786739	0.1579775	2.2104244	2.6889801	0.6127596	0.3339938					
923	0.1974980	0.1974978	0.5341209	0.0953194	0.0274953	-0.7251514	-0.4580119	0.7526467	0.3517888	0.4908826	0.7853981	1.0677452
	0.3999640	0.4794890	0.1564919	2.2110949	2.6904650	0.6115944	0.3325064					
924	0.1964332	0.1964331	0.5331118	0.0942380	0.0271756	-0.7258719	-0.4584126	0.7530475	0.3518460	0.4908826	0.7853981	1.0668879
	0.3979722	0.4803041	0.1549998	2.2117720	2.6919565	0.6104299	0.3310176					
925	0.1953679	0.1953678	0.5320972	0.0931559	0.0268559	-0.7265904	-0.4588155	0.7534522	0.3519022	0.4908826	0.7853981	1.0660229
	0.3959793	0.4811189	0.1535014	2.2124544	2.6934538	0.6092631	0.3295280					
926	0.1943014	0.1943013	0.5310844	0.0920733	0.0265362	-0.7273157	-0.4592152	0.7538519	0.3519564	0.4908826	0.7853981	1.0651693
	0.3939839	0.4819324	0.1519971	2.2131462	2.6949577	0.6080953	0.3280367					
927	0.1932341	0.1932340	0.5300684	0.0909901	0.0262164	-0.7280367	-0.4596155	0.7542541	0.3520101	0.4908826	0.7853981	1.0643129
	0.3919873	0.4827457	0.1504864	2.2138433	2.6964674	0.6069270	0.3265449					

928	0.1921661	0.1921663	0.5290529	0.0899062	0.0258967	-0.7287578	-0.4600159	0.7546545	0.3520648	0.4908826	0.7853981	1.0634575
	0.3899893	0.4835591	0.1489687	2.2145472	2.6979847	0.6057618	0.3250520					
929	0.1910980	0.1910979	0.5280369	0.0888218	0.0255770	-0.7296759	-0.4604143	0.7550529	0.3521195	0.4908826	0.7853981	1.0626087
	0.3879908	0.4843726	0.1474443	2.2152586	2.6995087	0.6045969	0.3235591					
930	0.1900290	0.1900288	0.5270185	0.0877369	0.0252573	-0.7301958	-0.4608135	0.7554531	0.3521726	0.4908826	0.7853981	1.0617571
	0.3859909	0.4851848	0.1459140	2.2159767	2.7010384	0.6034309	0.3220652					
931	0.1889445	0.1889444	0.5259998	0.0866513	0.0249376	-0.7306406	-0.4611711	0.7557783	0.3522359	0.4908826	0.7853981	1.0610657
	0.3839621	0.4859870	0.1443765	2.2167120	2.7026081	0.6022659	0.3205498					
932	0.1878725	0.1878724	0.5249757	0.0855651	0.0246179	-0.7315581	-0.4615688	0.7561760	0.3522857	0.4908826	0.7853981	1.0602207
	0.3819567	0.4867964	0.1428334	2.2174454	2.7041512	0.6010968	0.3190521					
933	0.1868009	0.1868008	0.5239521	0.0844783	0.0242982	-0.7322747	-1.4619657	0.7565729	0.3523362	0.4908826	0.7853981	1.0593777
	0.3799516	0.4876062	0.1412831	2.2181864	2.7057009	0.5999297	0.3175553					
934	0.1857288	0.1857287	0.5229298	0.0833908	0.0239785	-0.7329932	-0.4623636	0.7569717	0.3523883	0.4908826	0.7853981	1.0585318
	0.3779460	0.4884162	0.1397254	2.2189341	2.7072982	0.5987653	0.3160574					
935	0.1846551	0.1846550	0.5219028	0.0823027	0.0236588	-0.7337093	-0.4627599	0.7573680	0.3524371	0.4908826	0.7853981	1.0576916
	0.3759375	0.4892239	0.1381618	2.2196894	2.7088213	0.5975974	0.3145579					
936	0.1835814	0.1835813	0.5208765	0.0812143	0.0233391	-0.7344267	-0.4631568	0.7577658	0.3524867	0.4908826	0.7853981	1.0568495
	0.3739285	0.4900311	0.1365913	2.2204533	2.7103410	0.5964317	0.3130584					
937	0.1825066	0.1825064	0.5198476	0.0801250	0.0230194	-0.7351443	-0.4635536	0.7581636	0.3525348	0.4908826	0.7853981	1.0560074
	0.3719177	0.4908372	0.1350138	2.2212248	2.7119675	0.5952648	0.3115576					
938	0.1814307	0.1814306	0.5188178	0.0790352	0.0226997	-0.7358609	-0.4639496	0.7585606	0.3525831	0.4908826	0.7853981	1.0551682
	0.3699051	0.4916421	0.1334293	2.2220039	2.7135515	0.5940983	0.3100555					
939	0.1803539	0.1803538	0.5177848	0.0779447	0.0223799	-0.7365757	-0.4643447	0.7589557	0.3526290	0.4908826	0.7853981	1.0543337
	0.3678905	0.4924452	0.1318383	2.2227917	2.7151423	0.5929303	0.3085573					
940	0.1792770	0.1792769	0.5167540	0.0768536	0.0220602	-0.7372934	-0.4647408	0.7593536	0.3526771	0.4908826	0.7853981	1.0534935
	0.3658759	0.4932484	0.1302395	2.2235870	2.7167397	0.5917657	0.3070491					
941	0.1781991	0.1781990	0.5157201	0.0757619	0.0217405	-0.7380070	-0.4651346	0.7597475	0.3527233	0.4908826	0.7853981	1.0526628
	0.3638592	0.4940497	0.1286340	2.2243919	2.7183447	0.5905995	0.3055488					
942	0.1771201	0.1771200	0.5146844	0.0746698	0.0214208	-0.7387204	-0.4655283	0.7601412	0.3527685	0.4908826	0.7853981	1.0518332
	0.3618408	0.4948487	0.1270219	2.2252045	2.7199569	0.5894330	0.3040392					
943	0.1760406	0.1760405	0.5136473	0.0735768	0.0211011	-0.7394373	-0.4659237	0.7605385	0.3528129	0.4908826	0.7853981	1.0509968
	0.3598211	0.4956468	0.1254022	2.2260265	2.7215748	0.5882667	0.3025330					
944	0.1749607	0.1749606	0.5126112	0.0724832	0.0207814	-0.7401497	-0.4663163	0.7609311	0.3528588	0.4908826	0.7853981	1.0501709
	0.3578008	0.4964440	0.1237750	2.2268562	2.7232018	0.5871027	0.3010265					
945	0.1738788	0.1738787	0.5115691	0.0713891	0.0204617	-0.7408626	-0.4667095	0.7613252	0.3529005	0.4908826	0.7853981	1.0493431
	0.3557768	0.4972376	0.1221414	2.2276964	2.7248344	0.5859342	0.2995174					
946	0.1727968	0.1727967	0.5105240	0.0702943	0.0201420	-0.7415757	-0.4671019	0.7617177	0.3529434	0.4908826	0.7853981	1.0485182
	0.3537523	0.4980304	0.1205031	2.2285452	2.7264757	0.5847683	0.2980082					
947	0.1717139	0.1717138	0.5094846	0.0691988	0.0198222	-0.7422909	-0.4674954	0.7621131	0.3529848	0.4908826	0.7853981	1.0476885
	0.3517266	0.4988209	0.1188517	2.2294025	2.7281227	0.5836016	0.2964962					
948	0.1706305	0.1706304	0.5084434	0.0681027	0.0195025	-0.7430017	-0.4678886	0.7625042	0.3530289	0.4908826	0.7853981	1.0468683
	0.3496999	0.4996107	0.1171949	2.2302694	2.7297792	0.5824386	0.2949877					
949	0.1695468	0.1695467	0.5074009	0.0670062	0.0191829	-0.7437120	-0.4682772	0.7628949	0.3530720	0.4908826	0.7853981	1.0460501
	0.3476723	0.5003982	0.1155312	2.2311459	2.7314425	0.5812758	0.2934769					
950	0.1684617	0.1684616	0.5063539	0.0659089	0.0188631	-0.7444242	-0.4686683	0.7632874	0.3531120	0.4908826	0.7853981	1.0452280
	0.3456421	0.5011824	0.1138603	2.2320328	2.7331123	0.5801100	0.2919644					
951	0.1673758	0.1673757	0.5053068	0.0648109	0.0185434	-0.7451380	-0.4690609	0.7636814	0.3531528	0.4908826	0.7853981	1.0444040
	0.3436106	0.5019649	0.1121915	2.2329292	2.7347098	0.5789459	0.2904511					
952	0.1662895	0.1662894	0.5042602	0.0637123	0.0182237	-0.7458474	-0.4694566	0.7640711	0.3531943	0.4908826	0.7853981	1.0435896
	0.3415784	0.5027455	0.1104948	2.2338352	2.7364759	0.5777838	0.2889379					
953	0.1652023	0.1652022	0.5032119	0.0626131	0.0179040	-0.7465585	-0.4698511	0.7644625	0.3532349	0.4908826	0.7853981	1.0427723
	0.3395444	0.5035234	0.1088036	2.2347517	2.7381697	0.5766214	0.2874220					
954	0.1641141	0.1641140	0.5021612	0.0615132	0.0175843	-0.7472567	-0.4702495	0.7648510	0.3532743	0.4908826	0.7853981	1.0419617
	0.3375086	0.5042982	0.1070969	2.2356787	2.7398710	0.5754582	0.2859064					
955	0.1630141	0.1630139	0.5011088	0.0604130	0.0172646	-0.7479175	-0.4705564	0.7651821	0.3533198	0.4908826	0.7853981	1.0412712
	0.3354506	0.5050603	0.1053459	2.2366257	2.7416056	0.5742952	0.2843748					
956	0.1619231	0.1619230	0.5000518	0.0593119	0.0169449	-0.7486250	-0.4709742	0.7655699	0.3533554	0.4908826	0.7853981	1.0404634
	0.3334097	0.5058277	0.1036733	2.2375745	2.7433224	0.5731291	0.2828556					
957	0.1608321	0.1608319	0.4989955	0.0582101	0.0166252	-0.7493346	-0.4713631	0.7659598	0.3533916	0.4908826	0.7853981	1.0396519
	0.3313683	0.5065922	0.1019486	2.2385349	2.7450466	0.5719602	0.2813366					
958	0.1597404	0.1597403	0.4979377	0.0571077	0.0163054	-0.7500435	-0.4717513	0.7663489	0.3534271	0.4908826	0.7853981	1.0388432
	0.3293263	0.5073542	0.1002150	2.2395048	2.7467785	0.5707916	0.2798179					
959	0.1586474	0.1586472	0.4968768	0.0560047	0.0159857	-0.7507501	-0.4721392	0.7667358	0.3534608	0.4908826	0.7853981	1.0380383
	0.3272812	0.5081119	0.0984756	2.2404881	2.7485180	0.5696305	0.2782997					
960	0.1575539	0.1575537	0.4958149	0.0549011	0.0156660	-0.7514566	-0.4725270	0.7671266	0.3534940	0.4908826	0.7853981	1.0372267
	0.3252354	0.5088665	0.0967272	2.2414818	2.7502551	0.5684721	0.2767790					
961	0.1564595	0.1564593	0.4947531	0.0537967	0.0153463	-0.7521603	-0.4729127	0.7675123	0.3535281	0.4908826	0.7853981	1.0364265
	0.3231881	0.5096177	0.0949735	2.2424878	2.7520416	0.5673095	0.2752514					
962	0.1553646	0.1553645	0.4936846	0.0526920	0.0150266	-0.7528614	-0.4732976	0.7679000	0.3535600	0.4908826	0.7853981	1.0356226
	0.3211397	0.5103647	0.0932063	2.2435045	2.7537851	0.5661460	0.2737245					
963	0.1542682	0.1542681	0.4926222	0.0515869	0.0147059	-0.7535602	-0.4736806	0.7682871	0.3535913	0.4908826	0.7853981	1.0348206
	0.3190886	0.5111076	0.0915345	2.2445345	2.7555571	0.5649801	0.2721955					

964	0.1531714	0.1531712	0.4915554	0.0504801	0.0143872	-0.7542851	-0.4740708	0.7686723	0.3536229	0.4908826	0.7853981	1.0340233
	0.3170366	0.5118464	0.0896524	2.2465769	2.7573376	0.5638196	0.2706785					
965	0.1520734	0.1520733	0.4904854	0.0493732	0.0140675	-0.7549912	-0.4744503	0.7690586	0.3536524	0.4908826	0.7853981	1.0332241
	0.3149825	0.5125806	0.0878633	2.2466316	2.7591257	0.5626559	0.2691520					
966	0.1509746	0.1509745	0.4894145	0.0482657	0.0137478	-0.7556972	-0.4748416	0.7694449	0.3536816	0.4908826	0.7853981	1.0324259
	0.3129267	0.5133104	0.0860657	2.2476997	2.7609224	0.5614927	0.2676247					
967	0.1498753	0.1498752	0.4883437	0.0471575	0.0134280	-0.7564006	-0.4752253	0.7698286	0.3537113	0.4908826	0.7853981	1.0316334
	0.3108701	0.5140359	0.0842596	2.2487803	2.7627287	0.5603315	0.2661971					
968	0.1487747	0.1487746	0.4872682	0.0460488	0.0131064	-0.7571077	-0.4756108	0.7702160	0.3537376	0.4908826	0.7853981	1.0308342
	0.3088112	0.5147554	0.0824458	2.2498741	2.7645407	0.5591675	0.2646680					
969	0.1476732	0.1476731	0.4861923	0.0449393	0.0127867	-0.7578102	-0.4759936	0.7705989	0.3537645	0.4908826	0.7853981	1.0300446
	0.3067505	0.5154706	0.0806229	2.2509823	2.7663631	0.5580048	0.2631479					
970	0.1465711	0.1465710	0.4851160	0.0438291	0.0124694	-0.7585142	-0.4763769	0.7709831	0.3537916	0.4908826	0.7853981	1.0292530
	0.3046886	0.5161803	0.0787914	2.2521138	2.7681942	0.5568435	0.2616373					
971	0.1454685	0.1454684	0.4840392	0.0427183	0.0121492	-0.7592180	-0.4767600	0.7713672	0.3538186	0.4908826	0.7853981	1.0284624
	0.3026260	0.5168855	0.0769510	2.2532387	2.7700338	0.5556830	0.2599763					
972	0.1443644	0.1443643	0.4829583	0.0416066	0.0118295	-0.7599215	-0.4771429	0.7717510	0.3538430	0.4908826	0.7853981	1.0276728
	0.3005604	0.5175834	0.0751023	2.2543488	2.7718811	0.5545213	0.2584636					
973	0.1432598	0.1432596	0.4818779	0.0404946	0.0115098	-0.7606222	-0.4775239	0.7721320	0.3538684	0.4908826	0.7853981	1.0268898
	0.2984936	0.5182770	0.0732446	2.2554542	2.7737389	0.5531615	0.2569105					
974	0.1421549	0.1421549	0.4807966	0.0393819	0.0111901	-0.7613273	-0.4779074	0.7725174	0.3538932	0.4908826	0.7853981	1.0260983
	0.2964268	0.5189644	0.0713784	2.2565529	2.7756033	0.5522026	0.2553775					
975	0.1410389	0.1410388	0.4797110	0.0382684	0.0108704	-0.7620293	-0.4782916	0.7728997	0.3539216	0.4908826	0.7853981	1.0254164
	0.2943391	0.5196342	0.0695033	2.2576374	2.7775302	0.5510414	0.2538244					
976	0.1399316	0.1399316	0.4786263	0.0371542	0.0105507	-0.7626290	-0.4786416	0.7732297	0.3539453	0.4908826	0.7853981	1.0246372
	0.2922675	0.5203086	0.0676197	2.2587176	2.7793836	0.5498829	0.2522937					
977	0.1388238	0.1388237	0.4775401	0.0360394	0.0102310	-0.7633205	-0.4790224	0.7736114	0.3539680	0.4908826	0.7853981	1.0238552
	0.2901947	0.5209759	0.0657257	2.2597941	2.7812267	0.5487248	0.2507576					
978	0.1377152	0.1377151	0.4764530	0.0349236	0.0099112	-0.7640020	-0.4794032	0.7739932	0.3539906	0.4908826	0.7853981	1.0230732
	0.2881203	0.5216366	0.0638242	2.2608658	2.7830763	0.5475678	0.2492208					
979	0.1366054	0.1366053	0.4753631	0.0338076	0.0095915	-0.7647807	-0.4797842	0.7743722	0.3540114	0.4908826	0.7853981	1.0222979
	0.2860447	0.5222899	0.0619119	2.2619336	2.7850845	0.5464099	0.2476828					
980	0.1354944	0.1354947	0.4742719	0.0326908	0.0092716	-0.7654496	-0.4801615	0.7747524	0.3540319	0.4908826	0.7853981	1.0215206
	0.2839667	0.5229349	0.0599912	2.2629941	2.7870332	0.5452527	0.2461441					
981	0.1343837	0.1343837	0.4731802	0.0315734	0.0089521	-0.7661025	-0.4805419	0.7751347	0.3540522	0.4908826	0.7853981	1.0207405
	0.2818882	0.5235727	0.0580616	2.2640409	2.7889376	0.5440970	0.2446051					
982	0.1332709	0.1332709	0.4720848	0.0304552	0.0086324	-0.7667433	-0.4809194	0.7755127	0.3540699	0.4908826	0.7853981	1.0199693
	0.2798064	0.5242015	0.0561227	2.2650713	2.7908764	0.5429391	0.2430642					
983	0.1321573	0.1321572	0.4709871	0.0293363	0.0083127	-0.7673793	-0.4812981	0.7758920	0.3540872	0.4908826	0.7853981	1.0191946
	0.2777230	0.5248220	0.0541743	2.2660784	2.7928238	0.5417819	0.2415224					
984	0.1310434	0.1310433	0.4698909	0.0282167	0.0079930	-0.7680082	-0.4816764	0.7762712	0.3541058	0.4908826	0.7853981	1.0184221
	0.2756390	0.5254348	0.0522162	2.2670644	2.7947807	0.5406277	0.2399808					
985	0.1299284	0.1299284	0.4687923	0.0270964	0.0076733	-0.7686244	-0.4820529	0.7766477	0.3541229	0.4908826	0.7853981	1.0176554
	0.2735532	0.5260383	0.0502486	2.2680482	2.7967402	0.5394732	0.2384381					
986	0.1288123	0.1288123	0.4676911	0.0259754	0.0073535	-0.7692221	-0.4824333	0.7770256	0.3541387	0.4908826	0.7853981	1.0168858
	0.2714669	0.5266322	0.0482717	2.2721720	2.7987242	0.5383181	0.2368943					
987	0.1276955	0.1276954	0.4665834	0.0248540	0.0070339	-0.7698095	-0.4828067	0.7774034	0.3541535	0.4908826	0.7853981	1.0161180
	0.2693757	0.5272163	0.0462854	2.2735739	2.8007097	0.5371636	0.2353500					
988	0.1265782	0.1265781	0.4654863	0.0237316	0.0067142	-0.7703870	-0.4831835	0.7777811	0.3541695	0.4908826	0.7853981	1.0153503
	0.2672854	0.5277913	0.0442890	2.2749449	2.8027048	0.5360118	0.2338054					
989	0.1254597	0.1254597	0.4643818	0.0226086	0.0063944	-0.7709534	-0.4835593	0.7781578	0.3541843	0.4908826	0.7853981	1.0145855
	0.2651929	0.5283559	0.0422828	2.2764368	2.8047104	0.5348598	0.2322598					
990	0.1243322	0.1243321	0.4632731	0.0214849	0.0060747	-0.7715190	-0.4839332	0.7785347	0.3542011	0.4908826	0.7853981	1.0138246
	0.2631834	0.5289066	0.0402673	2.2779102	2.8067446	0.5337057	0.2307021					
991	0.1232118	0.1232117	0.4621648	0.0203605	0.0057550	-0.7721149	-0.4843065	0.7789099	0.3542138	0.4908826	0.7853981	1.0130716
	0.2609875	0.5294409	0.0382411	2.2793932	2.8087892	0.5325540	0.2291368					
992	0.1220909	0.1220907	0.4610568	0.0192354	0.0054353	-0.7726986	-0.4846823	0.7792839	0.3542274	0.4908826	0.7853981	1.0123044
	0.2588900	0.5299725	0.0362051	2.2808981	2.8108653	0.5314050	0.2276070					
993	0.1209691	0.1209691	0.4599475	0.0181095	0.0051156	-0.7732617	-0.4850569	0.7796193	0.3542405	0.4908826	0.7853981	1.0115243
	0.2567718	0.5304925	0.0341590	2.2824240	2.8128500	0.5302564	0.2260591					
994	0.1198465	0.1198465	0.4588359	0.0169832	0.0047959	-0.7738983	-0.4854339	0.7799942	0.3542520	0.4908826	0.7853981	1.0108662
	0.2546916	0.5311000	0.0321033	2.2839714	2.8149052	0.5291084	0.2245102					
995	0.1187226	0.1187226	0.4577222	0.0158560	0.0044762	-0.7744967	-0.4858136	0.7803669	0.3542629	0.4908826	0.7853981	1.0101128
	0.2525893	0.5316946	0.0301371	2.2855434	2.8169708	0.5279604	0.2229632					
996	0.1175984	0.1175984	0.4565840	0.0147281	0.0041565	-0.7750850	-0.4861972	0.7807415	0.3542745	0.4908826	0.7853981	1.0093565
	0.2504857	0.5319771	0.0279605	2.2871240	2.8189470	0.5268148	0.2214193					
997	0.1164734	0.1164733	0.4554936	0.0135994	0.0038368	-0.7756809	-0.4865816	0.7811176	0.3542847	0.4908826	0.7853981	1.0085974
	0.2483810	0.5324461	0.0258716	2.2887554	2.8211317	0.5256695	0.2198788					
998	0.1153463	0.1153463	0.4543729	0.0124701	0.0035170	-0.7762718	-0.4869677	0.7814868	0.3542924	0.4908826	0.7853981	1.0078487
	0.2462724	0.5328994	0.0237765	2.2903998	2.8232288	0.5245220	0.2183391					
999	0.1142193	0.1142192	0.4532551	0.0113401	0.0031973	-0.7768649	-0.4873551	0.7818623	0.3543012	0.4908826	0.7853981	1.0070963
	0.2441640	0.5333401	0.0216698	2.2923666	2.8253355	0.5233779	0.2168051					

```
1000 0.1130915 0.1130914 0.4521347 0.0102095 0.0028777-0.7793572-0.4876468 0.7822348 0.3543090 0.4908826 0.7853981 1.0063457
     0.2420539 0.5337652 0.0195510 2.2937593 2.8274527 0.5222344 0.2152025
1001 0.1119629 0.1119628 0.4510139 0.0090781 0.0025579-0.7800496-0.4880185 0.7826076 0.3543174 0.4908826 0.7853981 1.0055962
     0.2399425 0.5341758 0.0174221 2.2954779 2.8295803 0.5210929 0.2136496
1002 0.1108331 0.1108330 0.4498937 0.0079459 0.0022382-0.7807413-0.4883395 0.7829795 0.3543243 0.4908826 0.7853981 1.0048485
     0.2378289 0.5345701 0.0152826 2.2972231 2.8317194 0.5199513 0.2120955
1003 0.1096954 0.1096954 0.4487638 0.0068130 0.0019185-0.7813975-0.4887413 0.7833160 0.3543333 0.4908826 0.7853981 1.0041723
     0.2357005 0.5349368 0.0131325 2.2990365 2.8338442 0.5188085 0.2105315
1004 0.1085638 0.1085637 0.4476379 0.0056794 0.0015988-0.7820862-0.4891102 0.7836850 0.3543393 0.4908826 0.7853981 1.0034323
     0.2335833 0.5352975 0.0109714 2.3008070 2.8360453 0.5176690 0.2089762
1005 0.1074314 0.1074314 0.4465105 0.0045451 0.0012791-0.7827792-0.4894415 0.7840583 0.3543447 0.4908826 0.7853981 1.0026827
     0.2314650 0.5356407 0.0087994 2.3026352 2.8382158 0.5165305 0.2074206
1006 0.1062984 0.1062984 0.4453831 0.0034103 0.0009594-0.7834653-0.4897729 0.7844247 0.3543505 0.4908826 0.7853981 1.0019484
     0.2293453 0.5359660 0.0066163 2.3044930 2.8403988 0.5153944 0.2058691
1007 0.1051636 0.1051635 0.4442499 0.0022745 0.0006397-0.7841567-0.4901048 0.7847964 0.3543564 0.4908826 0.7853981 1.0012035
     0.2272223 0.5362710 0.0044230 2.3063812 2.8425913 0.5142568 0.2043377
1008 0.1040277 0.1040277 0.4431146 0.0011391 0.0003200-0.7848461-0.4904375 0.7851660 0.3543531 0.4908826 0.7853981 1.0004644
     0.2250972 0.5365568 0.0022179 2.3083010 2.8447952 0.5131158 0.2027496
1009 0.1028916 0.1028916 0.4419811 0.0000000 0.0000002-0.7855350-0.4907698 0.7855353 0.3543559 0.4908826 0.7853981 0.9997259
     0.2229718 0.5368233 0.0000017 2.3102503 2.8470136 0.5119811 0.2011918
   0.44198  0.61444  3.55802 -0.51198
1 IMAGE PLANE SPOT DIAGRAM ANALYSIS:

 THICKNESS =0.0570000  U =0.0         ALFAP =0.0         P =1.0000000

 CENTROID: ZCENTR = 0.0,  YCENTR =  0.0026398

 STANDARD DEVIATIONS:  SIGMAY =  0.0000121  SIGMAZ =  0.0000207

 RMS SPOT SIZE: RMSRAD =  0.0057336

 SPOT DIAGRAM ENERGY DENSITY VS. RADIUS FROM CENTROID:
  IZA     RADIUS    FRACTION

    1  0.0050000  0.6741935
    2  0.0100000  0.9483871
    3  0.0150000  0.9645161
    4  0.0200000  0.9870967
    5  0.0250000  1.0000000
    6  0.0300000  1.0000000
    7  0.0350000  1.0000000
    8  0.0400000  1.0000000
    9  0.0450000  1.0000000
   10  0.0500000  1.0000000
   11  0.0550000  1.0000000
   12  0.0600000  1.0000000
   13  0.0649999  1.0000000
   14  0.0699999  1.0000000
   15  0.0749999  1.0000000
   16  0.0799999  1.0000000
   17  0.0849999  1.0000000
   18  0.0899999  1.0000000
   19  0.0949999  1.0000000
   20  0.0999999  1.0000000
   21  0.1049999  1.0000000
   22  0.1099999  1.0000000
   23  0.1149999  1.0000000
   24  0.1199999  1.0000000
   25  0.1249999  1.0000000
   26  0.1299999  1.0000000
   27  0.1349999  1.0000000
   28  0.1399999  1.0000000
   29  0.1449999  1.0000000
   30  0.1499999  1.0000000
   31  0.1549999  1.0000000
   32  0.1599998  1.0000000
   33  0.1649998  1.0000000
   34  0.1699998  1.0000000
```

35	0.1749998	1.0000000
36	0.1799998	1.0000000
37	0.1849998	1.0000000
38	0.1899998	1.0000000
39	0.1949998	1.0000000
40	0.1999998	1.0000000
41	0.2049998	1.0000000
42	0.2099998	1.0000000
43	0.2149998	1.0000000
44	0.2199998	1.0000000
45	0.2249998	1.0000000
46	0.2299998	1.0000000
47	0.2349998	1.0000000
48	0.2399998	1.0000000
49	0.2449998	1.0000000
50	0.2499998	1.0000000
51	0.2549998	1.0000000
52	0.2599998	1.0000000
53	0.2649997	1.0000000
54	0.2699997	1.0000000
55	0.2749997	1.0000000
56	0.2799997	1.0000000
57	0.2849997	1.0000000
58	0.2899997	1.0000000
59	0.2949997	1.0000000
60	0.2999997	1.0000000
61	0.3049997	1.0000000
62	0.3099997	1.0000000
63	0.3149997	1.0000000
64	0.3199997	1.0000000
65	0.3249997	1.0000000
66	0.3299997	1.0000000
67	0.3349997	1.0000000
68	0.3399997	1.0000000
69	0.3449997	1.0000000
70	0.3499997	1.0000000
71	0.3549997	1.0000000
72	0.3599997	1.0000000
73	0.3649997	1.0000000
74	0.3699996	1.0000000
75	0.3749996	1.0000000
76	0.3799996	1.0000000
77	0.3849996	1.0000000
78	0.3899996	1.0000000
79	0.3949996	1.0000000
80	0.3999996	1.0000000
81	0.4049996	1.0000000
82	0.4099996	1.0000000
83	0.4149996	1.0000000
84	0.4199996	1.0000000
85	0.4249996	1.0000000
86	0.4299996	1.0000000
87	0.4349996	1.0000000
88	0.4399996	1.0000000
89	0.4449996	1.0000000
90	0.4499996	1.0000000
91	0.4549996	1.0000000
92	0.4599996	1.0000000
93	0.4649996	1.0000000
94	0.4699996	1.0000000
95	0.4749995	1.0000000
96	0.4799995	1.0000000
97	0.4849995	1.0000000
98	0.4899995	1.0000000
99	0.4949995	1.0000000
100	0.4999995	1.0000000

SPOT DIAGRAM CALCULATIONS COMPLETE.
TO OBTAIN PLOTS FROM THE PLOTTER OR THE PRINTER,
ISSUE THE FOLLOWING COMMAND:
FOR PRINTER PLOTS ENTER "LENSCOM PRINTER"
FOR PLOTTER GRAPHS ENTER "LENSCOM PLOTTER"
END OF PROGRAM

RESULTS FROM GRIN

2. Input: $X_C = -0.07$, DIV = -0.05, $\alpha_p = 0.0$

GRIA PARAPETERS(2):

ALPHA = 0.7853979 BETA = 0.3227880 RADIUS = 1.00000 INCIDENT ANGLE = 0.0 ITERATIONS = 1000

EDGE THICKNESS = 0.0500000 INDICES OF REFRACTION: N1 = 1.00000 N2 = 1.42157 N3 = 1.00000

FOCAL LENGTH FROM STATION ZERO = 4.00000 DELTA BETA= 0.00032

CENTER OF SYM(XC)=-0.07000 CHANGE IN N2(%)=-0.050 ALFAP= 0.0

NOTE:X-COORDINATES HAS BEEN SHIFTED IN CASE=2 BY X2(K);NOW,X2(K)=0.0 ETC.

J	X1	Y1	X2	Y2	BETA	I2P	I2	ETA	Y	I1P	I1	DYDXT
	E	THETAE	THETAO	PSI	PSIO	RR	RF					
1	1.0000000	1.0000000	1.0578299	0.9841160	0.3227880	0.1770834	0.1242387	0.1457046	0.0500000	0.5192339	0.7853981	6.8145685
	1.7758808	0.0341402	0.7174545	2.1238327	2.1541939	1.4968252	1.4645472					
2	0.9990332	0.9990329	1.0576835	0.9931174	0.3224677	0.1763687	0.1237326	0.1460991	0.0607717	0.5191766	0.7853981	6.7958994
	1.7744253	0.0345468	0.7170161	2.1239070	2.1547441	1.4960585	1.4631805					
3	0.9982181	0.9982177	1.0575380	0.9921186	0.3221475	0.1750044	0.1227734	0.1471431	0.0614657	0.5191280	0.7853981	6.7469873
	1.7732067	0.0349594	0.7165768	2.1237850	2.1550980	1.4952917	1.4620285					
4	0.9974065	0.9974065	1.0573902	0.9911208	0.3218273	0.1736302	0.1218372	0.1481571	0.0621548	0.5190799	0.7853981	6.6982575
	1.7719898	0.0353713	0.7161383	2.1237631	2.1554489	1.4945250	1.4608822					
5	0.9965956	0.9965956	1.0572424	0.9901232	0.3215071	0.1722565	0.1208414	0.1492506	0.0628436	0.5190316	0.7853981	6.6503172
	1.7707726	0.0357835	0.7156995	2.1237421	2.1557999	1.4937592	1.4597359					
6	0.9957882	0.9957879	1.0570917	0.9791265	0.3211868	0.1708695	0.1198663	0.1503173	0.0635273	0.5189835	0.7853981	6.6024132
	1.7695555	0.0361545	0.7152619	2.1237202	2.1561460	1.4929914	1.4585943					
7	0.9949798	0.9949794	1.0569401	0.9781302	0.3208666	0.1694861	0.1188936	0.1513805	0.0642104	0.5189357	0.7853981	6.5553312
	1.7683445	0.0366053	0.7148244	2.1236982	2.1564932	1.4922237	1.4574518					
8	0.9941672	0.9941668	1.0567894	0.9771340	0.3205464	0.1681308	0.1179406	0.1524156	0.0648972	0.5188876	0.7853981	6.5101261
	1.7671223	0.0370167	0.7143863	2.1236762	2.1568489	1.4914570	1.4563026					
9	0.9933543	0.9933545	1.0566387	0.9761376	0.3202262	0.1667696	0.1169835	0.1534566	0.0655839	0.5188399	0.7853981	6.4652700
	1.7658951	0.0374287	0.7139475	2.1236572	2.1572037	1.4906902	1.4551544					
10	0.9925466	0.9925462	1.0564880	0.9751413	0.3199059	0.1653891	0.1160129	0.1545169	0.0662678	0.5187922	0.7853981	6.4201975
	1.7646828	0.0378411	0.7135084	2.1236362	2.1575537	1.4899244	1.4540119					
11	0.9917382	0.9917382	1.0563345	0.9741465	0.3195857	0.1640121	0.1150448	0.1555737	0.0669485	0.5187445	0.7853981	6.3758812
	1.7634678	0.0382519	0.7130708	2.1236153	2.1579027	1.4891577	1.4528704					
12	0.9909316	0.9909306	1.0561815	0.9731519	0.3192655	0.1626254	0.1141659	0.1566401	0.0676258	0.5186967	0.7853981	6.3317633
	1.7622538	0.0386639	0.7126320	2.1235933	2.1582499	1.4883905	1.4517288					
13	0.9901227	0.9901223	1.0560246	0.9721574	0.3189453	0.1612610	0.1131106	0.1576843	0.0683066	0.5186494	0.7853981	6.2891397
	1.7610340	0.0390733	0.7121957	2.1235733	2.1586008	1.4876223	1.4505863					
14	0.9893122	0.9893118	1.0558681	0.9711635	0.3186250	0.1598964	0.1121511	0.1587286	0.0689859	0.5186017	0.7853981	6.2470646
	1.7598124	0.0394836	0.7117585	2.1235533	2.1589537	1.4868546	1.4494411					
15	0.9885064	0.9885060	1.0557108	0.9701700	0.3183048	0.1585131	0.1111786	0.1597918	0.0696608	0.5185544	0.7853981	6.2047911
	1.7585952	0.0398937	0.7113214	2.1235323	2.1592999	1.4860868	1.4483023					
16	0.9876961	0.9876961	1.0555525	0.9691771	0.3179846	0.1571518	0.1102215	0.1608328	0.0703377	0.5185068	0.7853981	6.1639338
	1.7573776	0.0403035	0.7108846	2.1235113	2.1596527	1.4853182	1.4471569					
17	0.9868857	0.9868852	1.0553932	0.9681843	0.3176643	0.1557747	0.1092533	0.1618897	0.0710113	0.5184594	0.7853981	6.1229887
	1.7561607	0.0407132	0.7104479	2.1234903	2.1600009	1.4845505	1.4460173					
18	0.9860805	0.9860801	1.0552330	0.9671923	0.3173441	0.1544167	0.1082985	0.1629274	0.0716855	0.5184122	0.7853981	6.0832558
	1.7549381	0.0411226	0.7100115	2.1234713	2.1603546	1.4837818	1.4448729					
19	0.9852744	0.9852740	1.0550728	0.9662001	0.3170239	0.1530398	0.1073305	0.1639841	0.0723576	0.5183649	0.7853981	6.0433941
	1.7537222	0.0415324	0.7095745	2.1234512	2.1607027	1.4830141	1.4437242					
20	0.9844711	0.9844707	1.0549101	0.9652088	0.3167037	0.1516597	0.1063603	0.1650440	0.0730256	0.5183181	0.7853981	6.0038757
	1.7525082	0.0419414	0.7091385	2.1234312	2.1610489	1.4822454	1.4425983					
21	0.9836635	0.9836635	1.0547466	0.9642183	0.3163834	0.1502894	0.1054031	0.1660851	0.0736944	0.5182711	0.7853981	5.9655476
	1.7512878	0.0423466	0.7087031	2.1234112	2.1613998	1.4814758	1.4414577					
22	0.9828544	0.9828539	1.0545835	0.9632276	0.3160632	0.1489440	0.1044509	0.1671193	0.0743657	0.5182239	0.7853981	5.9279413
	1.7500625	0.0427566	0.7082669	2.1233921	2.1617546	1.4807172	1.4403133					
23	0.9820498	0.9820492	1.0544195	0.9622371	0.3157430	0.1475698	0.1034849	0.1681731	0.0750328	0.5181770	0.7853981	5.8900890
	1.7488476	0.0431676	0.7078306	2.1233721	2.1621027	1.4799385	1.4391766					
24	0.9812445	0.9812439	1.0542526	0.9612480	0.3154228	0.1461967	0.1025196	0.1692261	0.0756971	0.5181302	0.7853981	5.8527403
	1.7476292	0.0435750	0.7073960	2.1233521	2.1624499	1.4791699	1.4380379					
25	0.9804350	0.9804345	1.0540848	0.9602587	0.3151025	0.1448418	0.1015670	0.1702607	0.0763623	0.5180830	0.7853981	5.8164797
	1.7464084	0.0439825	0.7069612	2.1233320	2.1627827	1.4783983	1.4368935					
26	0.9796004	0.9796000	1.0539169	0.9592700	0.3147823	0.1434748	0.1006061	0.1713035	0.0770261	0.5180366	0.7853981	5.7802429
	1.7451859	0.0443892	0.7065261	2.1233130	2.1631517	1.4776287	1.4357567					
27	0.9788262	0.9788257	1.0537472	0.9582819	0.3144621	0.1421172	0.0996445	0.1723548	0.0776865	0.5179898	0.7853981	5.7444181
	1.7439671	0.0447971	0.7060919	2.1232939	2.1635008	1.4768581	1.4346159					

28	0.9780161	0.9780157	1.0535774	0.9572940	0.3141419	0.1407658	0.0987015	0.1733760	0.0783511	0.5175426	0.7853981	5.7099028
	1.7427391	0.0442043	0.7056572	2.1232748	2.1638545	1.4760885	1.4334745					
29	0.9772127	0.9772123	1.0534048	0.9563070	0.3138216	0.1393892	0.0977339	0.1744324	0.0790080	0.5178962	0.7853981	5.6746187
	1.7415231	0.0456102	0.7052239	2.1232548	2.1642017	1.4753170	1.4323397					
30	0.9764978	0.9764073	1.0532322	0.9553211	0.3135014	0.1380320	0.0967798	0.1754694	0.0796660	0.5178498	0.7853981	5.6403904
	1.7403021	0.0466164	0.7047902	2.1232357	2.1645517	1.4745455	1.4312019					
31	0.9756041	0.9756037	1.0531586	0.9543335	0.3131812	0.1366683	0.0958212	0.1765129	0.0803220	0.5178033	0.7853981	5.6063480
	1.7390814	0.0476225	0.7043565	2.1232176	2.1649008	1.4737749	1.4300661					
32	0.9747574	0.9747570	1.0528860	0.9533468	0.3128610	0.1353173	0.0948715	0.1775437	0.0809811	0.5177570	0.7853981	5.5731106
	1.7378565	0.0486285	0.7039220	2.1231995	2.1652546	1.4730043	1.4289255					
33	0.9739921	0.9739923	1.0527096	0.9523613	0.3125407	0.1339536	0.0939130	0.1785871	0.0816348	0.5177106	0.7853981	5.5398550
	1.7366362	0.0496388	0.7034891	2.1231794	2.1656027	1.4722328	1.4277887					
34	0.9731910	0.9731906	1.0525312	0.9513770	0.3122205	0.1325902	0.0929546	0.1796303	0.0822843	0.5176646	0.7853981	5.5069818
	1.7354163	0.0506388	0.7030574	2.1231613	2.1659489	1.4714594	1.4266558					
35	0.9723862	0.9723858	1.0523539	0.9503918	0.3119003	0.1312360	0.0920027	0.1806642	0.0829370	0.5176182	0.7853981	5.4747763
	1.7341948	0.0516442	0.7026244	2.1231432	2.1662998	1.4706869	1.4255180					
36	0.9715816	0.9715806	1.0521755	0.9494074	0.3115801	0.1298792	0.0910490	0.1817009	0.0835850	0.5175719	0.7853981	5.4428511
	1.7329721	0.0526491	0.7021917	2.1231241	2.1666498	1.4699154	1.4243833					
37	0.9707778	0.9707774	1.0519953	0.9484236	0.3112598	0.1285223	0.0900954	0.1827375	0.0842375	0.5175259	0.7853981	5.4112825
	1.7317486	0.0536533	0.7017598	2.1231060	2.1669989	1.4691420	1.4232445					
38	0.9699755	0.9699755	1.0518141	0.9474404	0.3109396	0.1271593	0.0891374	0.1837803	0.0848841	0.5174800	0.7853981	5.3798809
	1.7305256	0.0546573	0.7013280	2.1230879	2.1673460	1.4683695	1.4221115					
39	0.9691684	0.9691679	1.0516338	0.9464566	0.3106194	0.1258184	0.0881950	0.1848009	0.0855357	0.5174336	0.7853981	5.3494854
	1.7293015	0.0556623	0.7008951	2.1230688	2.1677008	1.4675970	1.4209700					
40	0.9683803	0.9683803	1.0514517	0.9454739	0.3102992	0.1256915	0.0881912	0.1846077	0.0863815	0.5173714	0.7853981	5.3552170
	1.7276445	0.0500532	0.7004632	2.1231450	2.1684198	1.4668245	1.4194326					
41	0.9675527	0.9675523	1.0512695	0.9444906	0.3099789	0.1231464	0.0863169	0.1868325	0.0868351	0.5173414	0.7853981	5.2899637
	1.7268419	0.0504768	0.7003305	2.1230326	2.1686113	1.4660511	1.4186869					
42	0.9664838	0.9664834	1.0510845	0.9435091	0.3096587	0.1229408	0.0861683	0.1867179	0.0876647	0.5172803	0.7853981	5.2932882
	1.7252131	0.0508644	0.6995996	2.1230087	2.1691055	1.4652777	1.4171762					
43	0.9659456	0.9659454	1.0509005	0.9425265	0.3093385	0.1204367	0.0844127	0.1885018	0.0881205	0.5172499	0.7853981	5.2306385
	1.7243977	0.0512781	0.6991674	2.1229973	2.1691393	1.4645042	1.4164709					
44	0.9648842	0.9648837	1.0507145	0.9415456	0.3090183	0.1202155	0.0842533	0.1888027	0.0889467	0.5171892	0.7853981	5.2334480
	1.7227726	0.0516722	0.6987360	2.1229744	2.1697998	1.4637308	1.4149151					
45	0.9640616	0.9640611	1.0505266	0.9405650	0.3086980	0.1189576	0.0833690	0.1897404	0.0896006	0.5171425	0.7853981	5.2069588
	1.7215176	0.0520740	0.6983054	2.1229563	2.1701765	1.4629564	1.4137526					
46	0.9632557	0.9632553	1.0503387	0.9395845	0.3083778	0.1176050	0.0824187	0.1907728	0.0902399	0.5170970	0.7853981	5.1780920
	1.7202546	0.0524769	0.6978744	2.1229391	2.1705256	1.4621830	1.4126196					
47	0.9624551	0.9624547	1.0501509	0.9386039	0.3080575	0.1162421	0.0814615	0.1918148	0.0908784	0.5170515	0.7853981	5.1492643
	1.7190723	0.0528803	0.6974429	2.1229210	2.1708727	1.4614077	1.4114876					
48	0.9616556	0.9616554	1.0499620	0.9376236	0.3077374	0.1148872	0.0805092	0.1928501	0.0915150	0.5170061	0.7853981	5.1209297
	1.7178507	0.0532837	0.6970115	2.1229038	2.1712209	1.4606342	1.4103575					
49	0.9608638	0.9608631	1.0497713	0.9366441	0.3074171	0.1135186	0.0795476	0.1938985	0.0921475	0.5169613	0.7853981	5.0925426
	1.7166326	0.0536862	0.6965809	2.1228876	2.1715651	1.4598589	1.4092321					
50	0.9600658	0.9600654	1.0495826	0.9356649	0.3070969	0.1121524	0.0785864	0.1945465	0.0927808	0.5169159	0.7853981	5.0644665
	1.7154167	0.0540899	0.6961499	2.1228695	2.1719084	1.4590845	1.4081049					
51	0.9592710	0.9592706	1.0493860	0.9346868	0.3067766	0.1107791	0.0776231	0.1955975	0.0934081	0.5168712	0.7853981	5.0366039
	1.7141991	0.0544950	0.6957209	2.1228533	2.1722498	1.4583092	1.4069815					
52	0.9584741	0.9584737	1.0491915	0.9337089	0.3064564	0.1094183	0.0766602	0.1970482	0.0940369	0.5168260	0.7853981	5.0090456
	1.7129812	0.0549012	0.6952915	2.1228361	2.1725922	1.4575315	1.4059552					
53	0.9576756	0.9576746	1.0489960	0.9327319	0.3061362	0.1080561	0.0757102	0.1980801	0.0946662	0.5167810	0.7853981	4.9822626
	1.7117571	0.0553023	0.6948615	2.1228195	2.1729393	1.4567556	1.4047260					
54	0.9568785	0.9568785	1.0488005	0.9317538	0.3058160	0.1066982	0.0747565	0.1991178	0.0952533	0.5167364	0.7853981	4.9556046
	1.7105376	0.0557036	0.6944324	2.1228037	2.1732865	1.4559803	1.4036007					
55	0.9560814	0.9560810	1.0486021	0.9307770	0.3054957	0.1053368	0.0733003	0.2001589	0.0959185	0.5166913	0.7853981	4.9291315
	1.7093182	0.0560529	0.6940038	2.1227865	2.1736288	1.4552031	1.4024734					
56	0.9552845	0.9552841	1.0484029	0.9298017	0.3051755	0.1039761	0.0723446	0.2011995	0.0965423	0.5166466	0.7853981	4.9029436
	1.7080965	0.0564538	0.6935756	2.1227713	2.1739721	1.4544249	1.4013472					
57	0.9544875	0.9544874	1.0482035	0.9288244	0.3048553	0.1026149	0.0718886	0.2022403	0.0971659	0.5166020	0.7853981	4.8770142
	1.7068758	0.0568542	0.6931467	2.1227541	2.1743164	1.4536476	1.4002219					
58	0.9536892	0.9536887	1.0480042	0.9278487	0.3045351	0.1012721	0.0709441	0.2032650	0.0977507	0.5165573	0.7853981	4.8517456
	1.7056512	0.0572547	0.6927177	2.1227379	2.1746645	1.4528713	1.3991527					
59	0.9528967	0.9528963	1.0478025	0.9268731	0.3042148	0.0998933	0.0699751	0.2043245	0.0984084	0.5165127	0.7853981	4.8258753
	1.7044372	0.0576543	0.6922897	2.1227217	2.1749121	1.4520931	1.3979731					
60	0.9520988	0.9520984	1.0475996	0.9258996	0.3038946	0.0985089	0.0690033	0.2053457	0.0990296	0.5164680	0.7853981	4.8011942
	1.7032108	0.0580538	0.6918616	2.1227064	2.1753511	1.4513149	1.3968449					
61	0.9513028	0.9513024	1.0473967	0.9249238	0.3035744	0.0971854	0.0680256	0.2063850	0.0996479	0.5164238	0.7853981	4.7762260
	1.7019911	0.0584533	0.6914335	2.1226922	2.1756915	1.4505367	1.3957214					
62	0.9505092	0.9505088	1.0471926	0.9239474	0.3032542	0.0958159	0.0671141	0.2074383	0.1002650	0.5163792	0.7853981	4.7513638
	1.7007732	0.0588526	0.6910056	2.1226792	2.1760320	1.4497585	1.3945993					
63	0.9497162	0.9497158	1.0469875	0.9229755	0.3029339	0.0944684	0.0661678	0.2084656	0.1008813	0.5163350	0.7853981	4.7272654
	1.6995451	0.0592517	0.6905779	2.1226587	2.1763892	1.4489803	1.3934746					

64	0.5489155	0.9489151	1.0467815	0.9229018	0.3926137	0.0931179	0.0652196	0.2094958	0.1014991	0.5162903	0.7853981	4.7033281
	1.6983242	0.0556507	0.6901501	2.1226425	2.1767263	1.4482012	1.3523464					
65	0.5481268	0.9481259	1.0465746	0.9210287	0.3922995	0.0917421	0.0642587	0.2105514	0.1021093	0.5162466	0.7853981	4.6790419
	1.6971105	0.0560854	0.6897228	2.1226273	2.1770639	1.4474220	1.3512306					
66	0.5473266	0.9473256	1.0463667	0.9200556	0.3919709	0.0904114	0.0633194	0.2115619	0.1027264	0.5162019	0.7853981	4.6560173
	1.6958605	0.0564882	0.6892952	2.1226110	2.1774149	1.4466429	1.3500995					
67	0.5465327	0.9465322	1.0461157	0.9190831	0.3916530	0.0890550	0.0623673	0.2125980	0.1033375	0.5161581	0.7853981	4.6326323
	1.6946588	0.0569865	0.6888680	2.1225967	2.1777502	1.4458628	1.3489780					
68	0.5457378	0.9457368	1.0459480	0.9181111	0.3913328	0.0877154	0.0614199	0.2136274	0.1039489	0.5161139	0.7853981	4.6098210
	1.6934356	0.0574844	0.6884410	2.1225815	2.1781034	1.4450836	1.3478536					
69	0.5449402	0.9449419	1.0457382	0.9171388	0.3910126	0.0863495	0.0604681	0.2146631	0.1045601	0.5160697	0.7853981	4.5866880
	1.6922121	0.0579832	0.6880135	2.1225662	2.1784468	1.4443035	1.3467311					
70	0.5441494	0.9441450	1.0455265	0.9161675	0.3906924	0.0849995	0.0595267	0.2156925	0.1051678	0.5160260	0.7853981	4.5641079
	1.6909854	0.0584809	0.6875869	2.1225510	2.1787910	1.4435244	1.3456096					
71	0.5433486	0.9433483	1.0453157	0.9151957	0.3903721	0.0836700	0.0585874	0.2167021	0.1057820	0.5159818	0.7853981	4.5421686
	1.6897564	0.0589787	0.6871590	2.1225367	2.1791430	1.4427443	1.3444786					
72	0.5425516	0.9425512	1.0451012	0.9142255	0.3900519	0.0822957	0.0576229	0.2177563	0.1063827	0.5159383	0.7853981	4.5194731
	1.6885432	0.0594765	0.6867388	2.1225214	2.1794786	1.4419632	1.3433656					
73	0.5417535	0.9417530	1.0448866	0.9132547	0.3897317	0.0809627	0.0566875	0.2187650	0.1069911	0.5158942	0.7853981	4.4978782
	1.6873129	0.0599742	0.6863068	2.1225071	2.1798206	1.4411821	1.3422374					
74	0.5409528	0.9409519	1.0446701	0.9122852	0.3894115	0.0795081	0.0557299	0.2198193	0.1075976	0.5158504	0.7853981	4.4758053
	1.6860752	0.0604719	0.6858814	2.1224918	2.1801672	1.4404001	1.3411197					
75	0.5401513	0.9401508	1.0444546	0.9113150	0.3890912	0.0782717	0.0547691	0.2208195	0.1081999	0.5158067	0.7853981	4.4547396
	1.6848312	0.0609696	0.6854547	2.1224775	2.1805182	1.4396191	1.3399515					
76	0.5393494	0.9393484	1.0442381	0.9103455	0.3887710	0.0769269	0.0538555	0.2218441	0.1088036	0.5157629	0.7853981	4.4334774
	1.6835807	0.0614674	0.6850283	2.1224633	2.1808634	1.4388380	1.3387691					
77	0.5385471	0.9385471	1.0440197	0.9093766	0.3884508	0.0755754	0.0529012	0.2228754	0.1094038	0.5157195	0.7853981	4.4122725
	1.6824112	0.0618614	0.6846026	2.1224485	2.1812067	1.4380560	1.3777494					
78	0.5377488	0.9377484	1.0437994	0.9084081	0.3881306	0.0742088	0.0519485	0.2239218	0.1099996	0.5156758	0.7853981	4.3909540
	1.6811552	0.0623572	0.6841776	2.1224346	2.1815494	1.4372739	1.3766346					
79	0.5370026	0.9370021	1.0435791	0.9074396	0.3878103	0.0728735	0.0510117	0.2249368	0.1106007	0.5156325	0.7853981	4.3704615
	1.6798965	0.0628550	0.6837520	2.1224194	2.1818914	1.4364901	1.3755053					
80	0.5362558	0.9362554	1.0433585	0.9064721	0.3874901	0.0715325	0.0500710	0.2259576	0.1111971	0.5155891	0.7853981	4.3500309
	1.6786338	0.0633528	0.6833274	2.1224060	2.1822357	1.4357071	1.3743687					
81	0.5354585	0.9354581	1.0431385	0.9055051	0.3871699	0.0701756	0.0491192	0.2269943	0.1117907	0.5155457	0.7853981	4.3294716
	1.6775167	0.0638433	0.6829033	2.1223917	2.1825743	1.4349222	1.3732700					
82	0.5346255	0.9346255	1.0429087	0.9045382	0.3868497	0.0688347	0.0481787	0.2280149	0.1123850	0.5155025	0.7853981	4.3094082
	1.6762856	0.0643382	0.6824790	2.1223783	2.1829185	1.4341383	1.3721504					
83	0.5338259	0.9338286	1.0426846	0.9035711	0.3865294	0.0675102	0.0472497	0.2290152	0.1129825	0.5154588	0.7853981	4.2898378
	1.6750574	0.0648336	0.6820540	2.1223640	2.1832685	1.4333553	1.3710241					
84	0.5330332	0.9330378	1.0424585	0.9026047	0.3862092	0.0661636	0.0463054	0.2300456	0.1135737	0.5154158	0.7853981	4.2700100
	1.6738325	0.0653289	0.6816298	2.1223507	2.1836109	1.4325705	1.3698964					
85	0.5322471	0.9322466	1.0422306	0.9016390	0.3858890	0.0648138	0.0453588	0.2310752	0.1141631	0.5153726	0.7853981	4.2502556
	1.6726074	0.0658223	0.6812063	2.1223373	2.1839514	1.4317846	1.3687678					
86	0.5314522	0.9314518	1.0420036	0.9006730	0.3855688	0.0634867	0.0444082	0.2320821	0.1147560	0.5153296	0.7853981	4.2311802
	1.6713782	0.0663171	0.6807818	2.1223240	2.1842905	1.4310047	1.3676653					
87	0.5306559	0.9306551	1.0417757	0.8997075	0.3852485	0.0621470	0.0434589	0.2331015	0.1153464	0.5152863	0.7853981	4.2119932
	1.6701488	0.0668117	0.6803575	2.1223097	2.1846437	1.4302158	1.3665447					
88	0.5298585	0.9298581	1.0415440	0.8987431	0.3849283	0.0607920	0.0425389	0.2341363	0.1159304	0.5152434	0.7853981	4.1926823
	1.6689262	0.0673046	0.6799350	2.1222963	2.1849813	1.4294291	1.3654259					
89	0.5290595	0.9290591	1.0413122	0.8977786	0.3846081	0.0594493	0.0415975	0.2351588	0.1165156	0.5152006	0.7853981	4.1737680
	1.6677000	0.0677998	0.6795126	2.1222830	2.1853237	1.4286432	1.3643122					
90	0.5282856	0.9282854	1.0410824	0.8968138	0.3842879	0.0581204	0.0406660	0.2361675	0.1171048	0.5151576	0.7853981	4.1552658
	1.6664671	0.0682923	0.6790876	2.1222706	2.1856709	1.4278574	1.3631897					
91	0.5274918	0.9274914	1.0408506	0.8958492	0.3839676	0.0568002	0.0397405	0.2371674	0.1176922	0.5151148	0.7853981	4.1370773
	1.6652336	0.0687864	0.6786637	2.1222582	2.1860199	1.4270716	1.3620672					
92	0.5267022	0.9267018	1.0406170	0.8948858	0.3836474	0.0554492	0.0387936	0.2381982	0.1182744	0.5150719	0.7853981	4.1194816
	1.6640100	0.0692796	0.6782407	2.1222448	2.1863594	1.4262848	1.3609514					
93	0.5256446	0.9256443	1.0403843	0.8939217	0.3833272	0.0540838	0.0378737	0.2390463	0.1190440	0.5150148	0.7853981	4.1212120
	1.6627367	0.0697737	0.6778165	2.1222277	2.1870546	1.4254990	1.3594579					
94	0.5250866	0.9250861	1.0401506	0.8929593	0.3830070	0.0529219	0.0373222	0.2400851	0.1196452	0.5145847	0.7853981	4.0848522
	1.6615305	0.0702665	0.6773926	2.1222181	2.1870918	1.4247131	1.3586683					
95	0.9240845	0.9240841	1.0399151	0.8913551	0.2926867	0.0525130	0.0367342	0.2401737	0.1201933	0.5149305	0.7853981	4.0832863
	1.6599445	0.0719918	0.6769692	2.1222019	2.1877146	1.4239264	1.3572521					
96	0.5235056	0.9235064	1.0396795	0.8911323	0.2923665	0.0502401	0.0351439	0.2421264	0.1206262	0.5148997	0.7853981	4.0490475
	1.6590454	0.0723535	0.6765455	2.1221933	2.1877766	1.4231386	1.3564358					
97	0.5225288	0.9225278	1.0394421	0.8910697	0.2922462	0.0497332	0.0347845	0.2423161	0.1213357	0.5148471	0.7853981	4.0457516
	1.6575241	0.0727355	0.6761224	2.1221781	2.1883688	1.4223518	1.3550529					
98	0.5216946	0.9216944	1.0392036	0.8891079	0.2917261	0.0485927	0.0339872	1.2431334	0.1219434	0.5148025	0.7853981	4.0316029
	1.6562262	0.0731304	0.6756995	2.1221657	2.1887712	1.4215641	1.3538752					
99	0.9208945	0.9208944	1.0389652	0.8881457	0.2914058	0.0472969	0.0330794	0.2441089	0.1225279	0.5147592	0.7853981	4.0148382
	1.6549826	0.0735233	0.6752762	2.1221533	2.1891271	1.4207764	1.3527441					

100	0.9201262	0.9201262	1.0387239	0.8871847	0.2910856	0.0458653	0.0320767	0.2457203	0.1230872	0.5147179	0.7853981	3.9958963
	1.6537876	0.0739159	0.6740541	2.1221409	2.1894407	1.4199877	1.3516589					
101	0.9193512	0.9153568	1.0384817	0.8862239	0.2907653	0.0444432	0.0310008	0.2463221	0.1236464	0.5146770	0.7853981	3.9772835
	1.6525488	0.0743083	0.6744322	2.1221294	2.1897564	1.4191980	1.3505716					
102	0.9185726	0.9185722	1.0382414	0.8852626	0.2904451	0.0430882	0.0301318	0.2473570	0.1242181	0.5146350	0.7853981	3.9599495
	1.6513612	0.0747718	0.6746085	2.1221177	2.1900943	1.4184123	1.3494625					
103	0.9178134	0.9178130	1.0379972	0.8843522	0.2901249	0.0416190	0.0291030	0.2485059	0.1247683	0.5145944	0.7853981	3.9408712
	1.6501637	0.0750543	0.6735868	2.1221066	2.1903963	1.4176197	1.3483896					
104	0.9170303	0.9170378	1.0377541	0.8833421	0.2898047	0.0402265	0.0281280	0.2495782	0.1253304	0.5145531	0.7853981	3.9232197
	1.6489733	0.0754871	0.6731642	2.1220951	2.1907215	1.4168310	1.3472939					
105	0.9162696	0.9162686	1.0375090	0.8823820	0.2894844	0.0388191	0.0271357	0.2506754	0.1258866	0.5145122	0.7853981	3.9053125
	1.6477737	0.0758756	0.6727415	2.1220837	2.1910381	1.4160414	1.3462067					
106	0.9155056	0.9155052	1.0372620	0.8814227	0.2891642	0.0373598	0.0261211	0.2518044	0.1264367	0.5144713	0.7853981	3.8870440
	1.6465845	0.0762715	0.6723206	2.1220722	2.1913452	1.4152498	1.3451281					
107	0.9147275	0.9147275	1.0370155	0.8804633	0.2888440	0.0359806	0.0251555	0.2528634	0.1269976	0.5144300	0.7853981	3.8700542
	1.6453965	0.0766637	0.6718982	2.1220617	2.1916742	1.4144602	1.3440254					
108	0.9137573	0.9137568	1.0367670	0.8795047	0.2885238	0.0354479	0.0247819	0.2530759	0.1276895	0.5143782	0.7853981	3.8666630
	1.6439566	0.0770470	0.6714772	2.1220465	2.1922569	1.4136686	1.3426571					
109	0.9131062	0.9131058	1.0365210	0.8785453	0.2882035	0.0335116	0.0234271	0.2546920	0.1281625	0.5143438	0.7853981	3.8410444
	1.6428308	0.0774451	0.6710539	2.1220319	2.1924191	1.4128790	1.3417368					
110	0.9122678	0.9122674	1.0362682	0.8775877	0.2878833	0.0324088	0.0226551	0.2554745	0.1287586	0.5142996	0.7853981	3.8287544
	1.6415281	0.0778323	0.6706340	2.1220264	2.1929202	1.4120865	1.3405523					
111	0.9114611	0.9114611	1.0360165	0.8766301	0.2875631	0.0311574	0.0217792	0.2564057	0.1293334	0.5142568	0.7853981	3.8142233
	1.6402669	0.0782215	0.6702134	2.1220150	2.1931934	1.4112940	1.3394127					
112	0.9106844	0.9106844	1.0357647	0.8756724	0.2872429	0.0297768	0.0208132	0.2574661	0.1298877	0.5142156	0.7853981	3.7978010
	1.6390543	0.0786126	0.6697921	2.1220045	2.1935205	1.4105024	1.3383159					
113	0.9059355	0.9059395	1.0355139	0.8747144	0.2869226	0.0282567	0.0197497	0.2586660	0.1304209	0.5141763	0.7853981	3.7793798
	1.6378906	0.0790056	0.6693689	2.1219931	2.1938057	1.4097109	1.3372622					
114	0.9093030	0.9093026	1.0352583	0.8737578	0.2866024	0.0262651	0.0183568	0.2603374	0.1308746	0.5141426	0.7853981	3.7539559
	1.6368542	0.0794506	0.6689499	2.1219854	2.1939478	1.4089174	1.3363628					
115	0.9086926	0.9086924	1.0350037	0.8729010	0.2862822	0.0241569	0.0168826	0.2621253	0.1313111	0.5141107	0.7853981	3.7271910
	1.6359367	0.0797976	0.6685290	2.1219778	2.1940546	1.4081240	1.3354998					
116	0.9078543	0.9078539	1.0347471	0.8718448	0.2859620	0.0234464	0.0161057	0.2629156	0.1319031	0.5140661	0.7853981	3.7154560
	1.6346264	0.0801849	0.6681088	2.1219654	2.1944618	1.4073296	1.3343143					
117	0.9070651	0.9070647	1.0344887	0.8708891	0.2856417	0.0217270	0.0151829	0.2639147	0.1324592	0.5140246	0.7853981	3.7007198
	1.6333914	0.0805734	0.6676893	2.1219549	2.1948051	1.4065351	1.3331995					
118	0.9062825	0.9062821	1.0342312	0.8699332	0.2853215	0.0203894	0.0142415	0.2649321	0.1330116	0.5139837	0.7853981	3.6858244
	1.6321646	0.0809630	0.6672688	2.1219454	2.1951437	1.4057417	1.3320932					
119	0.9055011	0.9055007	1.0339737	0.8689774	0.2850013	0.0190327	0.0132987	0.2659686	0.1335633	0.5139426	0.7853981	3.6707659
	1.6309414	0.0813532	0.6668477	2.1219339	2.1954765	1.4049473	1.3309889					
120	0.9047316	0.9047312	1.0337152	0.8680218	0.2846811	0.0176321	0.0123194	0.2670490	0.1341058	0.5139021	0.7853981	3.6551886
	1.6297356	0.0817436	0.6664268	2.1219244	2.1957960	1.4041538	1.3299017					
121	0.9039711	0.9039711	1.0334535	0.8670670	0.2843609	0.0161908	0.0113118	0.2681701	0.1346388	0.5138626	0.7853981	3.6391554
	1.6285429	0.0821332	0.6660072	2.1219149	2.1961021	1.4033585	1.3288279					
122	0.9032006	0.9032002	1.0331926	0.8661125	0.2840406	0.0147941	0.0103355	0.2692465	0.1351752	0.5138221	0.7853981	3.6238832
	1.6273336	0.0825227	0.6655871	2.1219053	2.1964226	1.4025631	1.3277374					
123	0.9024363	0.9024358	1.0329294	0.8651581	0.2837204	0.0133690	0.0093393	0.2703514	0.1357133	0.5137820	0.7853981	3.6083298
	1.6261344	0.0829118	0.6651675	2.1218958	2.1967335	1.4017668	1.3266582					
124	0.9016665	0.9016655	1.0326662	0.8642043	0.2834002	0.0119739	0.0083637	0.2714272	0.1362511	0.5137417	0.7853981	3.5933056
	1.6249275	0.0833010	0.6647477	2.1218863	2.1970530	1.4009714	1.3255701					
125	0.9008647	0.9008540	1.0324020	0.8632533	0.2831799	0.0105931	0.0073994	0.2724969	0.1367893	0.5137016	0.7853981	3.5786190
	1.6237138	0.0836902	0.6643278	2.1218767	2.1973772	1.4001751	1.3244791					
126	0.8998746	0.8998742	1.0321369	0.8622966	0.2827597	0.0091345	0.0063574	0.2724552	0.1374568	0.5136485	0.7853981	3.5790567
	1.6225123	0.0840659	0.6639082	2.1218643	2.1981315	1.3993788	1.3233381					
127	0.8990694	0.8990690	1.0318708	0.8613431	0.2824395	0.0081726	0.0057089	0.2742669	0.1379185	0.5136167	0.7853981	3.5541983
	1.6211634	0.0844647	0.6634884	2.1218567	2.1981277	1.3985815	1.3221827					
128	0.8982903	0.8982859	1.0316038	0.8603503	0.2821193	0.0077104	0.0053840	0.2744089	0.1385961	0.5135659	0.7853981	3.5522642
	1.6196241	0.0848446	0.6630691	2.1218443	2.1987286	1.3977842	1.3207999					
129	0.8977175	0.8977171	1.0311358	0.8594373	0.2817990	0.0054466	0.0038037	0.2763524	0.1389535	0.5135360	0.7853981	3.5259781
	1.6187225	0.0852413	0.6626496	2.1218328	2.1987858	1.3969870	1.3199892					
130	0.8967162	0.8967158	1.0310678	0.8584846	0.2814788	0.0050861	0.0035517	0.2763928	0.1396853	0.5134841	0.7853981	3.5254354
	1.6171414	0.0856209	0.6622297	2.1218271	2.1994171	1.3961897	1.3185740					
131	0.8958985	0.8958985	1.0307895	0.8575318	0.2811586	0.0038909	0.0027243	0.2772576	0.1402507	0.5134419	0.7853981	3.5138559
	1.6158628	0.0860083	0.6618093	2.1218166	2.1998005	1.3953924	1.3174191					
132	0.8951385	0.8951385	1.0305300	0.8565757	0.2808384	0.0026421	0.0018169	0.2782363	0.1407954	0.5134008	0.7853981	3.5008392
	1.6146193	0.0863961	0.6613896	2.1218091	2.2001486	1.3945942	1.3163223					
133	0.8943216	0.8943211	1.0302591	0.8556277	0.2805181	0.0012878	0.0008991	0.2792303	0.1413372	0.5133601	0.7853981	3.4877090
	1.6133804	0.0867838	0.6609700	2.1217995	2.2004919	1.3937960	1.3151903					
134	0.8935304	0.8935300	1.0299883	0.8546759	0.2801979	0.0000035	0.0000017	0.2801554	0.1418816	0.5133154	0.7853981	3.4750462
	1.6121321	0.0871719	0.6605495	2.1217919	2.2008446	1.3929987	1.3140717					
135	0.8927457	0.8927453	1.0297155	0.8537245	0.2798777	-0.0013237	-0.0009241	0.2812014	0.1424196	0.5132787	0.7853981	3.4619389
	1.6108956	0.0875594	0.6601306	2.1217913	2.2011833	1.3921995	1.3129635					

136	0.8919575	0.8919575	1.0294418	0.8527736	0.2795575	-0.0026274	-0.0018342	0.2821849	0.1429598	0.5132380	0.7853981	3.4492111
	1.6096554	0.0879467	0.6597113	2.1217737	2.2015295	1.3513994	1.3118496					
137	0.8911651	0.8911687	1.0291672	0.8518228	0.2792372	-0.0039307	-0.0027428	0.2831680	0.1434976	0.5131974	0.7853981	3.4365749
	1.6084131	0.0883337	0.6592922	2.1217642	2.2018757	1.3506002	1.3107347					
138	0.8903787	0.8903782	1.0288916	0.8508723	0.2789170	-0.0052177	-0.0036420	0.2841347	0.1440366	0.5131571	0.7853981	3.4242315
	1.6071663	0.0887207	0.6588730	2.1217566	2.2022257	1.3498101	1.3096180					
139	0.8895918	0.8895913	1.0286150	0.8499215	0.2785968	-0.0065303	-0.0045580	0.2851271	0.1445722	0.5131164	0.7853981	3.4116459
	1.6059256	0.0891076	0.6584539	2.1217480	2.2025690	1.3489999	1.3085060					
140	0.8888061	0.8888057	1.0283365	0.8489724	0.2782766	-0.0078357	-0.0054688	0.2861122	0.1451049	0.5130761	0.7853981	3.3992357
	1.6046848	0.0894936	0.6580357	2.1217403	2.2029123	1.3481989	1.3073959					
141	0.8880174	0.8880169	1.0280581	0.8480226	0.2779563	-0.0091380	-0.0063775	0.2870944	0.1456358	0.5130354	0.7853981	3.3869467
	1.6034422	0.0898803	0.6576167	2.1217308	2.2032576	1.3473978	1.3062811					
142	0.8872300	0.8872296	1.0277786	0.8470732	0.2776361	-0.0104393	-0.0072851	0.2880754	0.1461727	0.5129951	0.7853981	3.3747520
	1.6021988	0.0902666	0.6571981	2.1217232	2.2036028	1.3465967	1.3051682					
143	0.8864405	0.8864405	1.0274982	0.8461241	0.2773159	-0.0117248	-0.0081816	0.2890406	0.1467057	0.5129549	0.7853981	3.3628330
	1.6009512	0.0906528	0.6567795	2.1217155	2.2039528	1.3457946	1.3040533					
144	0.8856553	0.8856549	1.0272160	0.8451755	0.2769957	-0.0130384	-0.0090978	0.2900341	0.1472344	0.5129147	0.7853981	3.3506460
	1.5997100	0.0910385	0.6563614	2.1217079	2.2042942	1.3449916	1.3029432					
145	0.8848685	0.8848684	1.0269327	0.8442270	0.2766754	-0.0143360	-0.0100027	0.2910115	0.1477629	0.5128747	0.7853981	3.3387337
	1.5984655	0.0914240	0.6559435	2.1217003	2.2046394	1.3441887	1.3018312					
146	0.8840794	0.8840790	1.0266495	0.8432782	0.2763551	-0.0156298	-0.0109047	0.2919850	0.1482934	0.5128345	0.7853981	3.3269472
	1.5972185	0.0918099	0.6555248	2.1216927	2.2049866	1.3433857	1.3007164					
147	0.8832890	0.8832886	1.0263662	0.8423302	0.2760350	-0.0169075	-0.0117954	0.2929424	0.1488243	0.5127943	0.7853981	3.3154297
	1.5959673	0.0921959	0.6551061	2.1216850	2.2053385	1.3425836	1.2995987					
148	0.8825014	0.8825009	1.0260811	0.8413820	0.2757147	-0.0181742	-0.0126754	0.2938788	0.1493516	0.5127541	0.7853981	3.3037577
	1.5947218	0.0925817	0.6546877	2.1216774	2.2056847	1.3417797	1.2984858					
145	0.8817165	0.8817161	1.0257950	0.8404346	0.2753945	-0.0194193	-0.0136180	0.2949038	0.1498758	0.5127142	0.7853981	3.2920599
	1.5934801	0.0929672	0.6542696	2.1216698	2.2060270	1.3409757	1.2973766					
150	0.8809323	0.8809319	1.0255079	0.8394874	0.2750742	-0.0206514	-0.0145164	0.2958856	0.1503987	0.5126743	0.7853981	3.2804747
	1.5922378	0.0933524	0.6538516	2.1216640	2.2063704	1.3401718	1.2962685					
151	0.8801483	0.8801480	1.0252199	0.8385403	0.2747540	-0.0218770	-0.0154122	0.2968510	0.1509237	0.5126345	0.7853981	3.2691555
	1.5909982	0.0937376	0.6534336	2.1216564	2.2067194	1.3393678	1.2951536					
152	0.8793546	0.8793542	1.0249310	0.8375932	0.2744338	-0.0233025	-0.0163079	0.2978163	0.1514478	0.5125943	0.7853981	3.2579098
	1.5897585	0.0941227	0.6530156	2.1216497	2.2070675	1.3385629	1.2940389					
153	0.8785651	0.8785651	1.0246420	0.8366463	0.2741136	-0.0246676	-0.0172031	0.2987812	0.1519721	0.5125545	0.7853981	3.2467394
	1.5884886	0.0945081	0.6525972	2.1216421	2.2074165	1.3377580	1.2929239					
154	0.8777786	0.8777782	1.0243521	0.8356997	0.2737933	-0.0259619	-0.0181047	0.2997552	0.1524939	0.5125147	0.7853981	3.2355328
	1.5872413	0.0948935	0.6521788	2.1216354	2.2077627	1.3369531	1.2918119					
155	0.8769922	0.8769917	1.0240602	0.8347537	0.2734731	-0.0272523	-0.0190034	0.3007255	0.1530133	0.5124748	0.7853981	3.2244396
	1.5859941	0.0952781	0.6517612	2.1216278	2.2081079	1.3361473	1.2907000					
156	0.8762050	0.8762046	1.0237675	0.8338076	0.2731529	-0.0285426	-0.0199019	0.3016955	0.1535324	0.5124350	0.7853981	3.2134150
	1.5847464	0.0956628	0.6513434	2.1216221	2.2084541	1.3353405	1.2895880					
157	0.8754176	0.8754172	1.0234747	0.8328621	0.2728327	-0.0298324	-0.0207999	0.3026651	0.1540514	0.5123956	0.7853981	3.2024727
	1.5834981	0.0960475	0.6509255	2.1216154	2.2088013	1.3345346	1.2884759					
158	0.8746305	0.8746305	1.0231800	0.8319167	0.2725124	-0.0311157	-0.0216933	0.3036281	0.1545681	0.5123558	0.7853981	3.1916656
	1.5822486	0.0964317	0.6505080	2.1216097	2.2091484	1.3337278	1.2873631					
159	0.8738446	0.8738444	1.0228844	0.8309717	0.2721922	-0.0324080	-0.0225930	0.3046002	0.1550834	0.5123163	0.7853981	3.1808233
	1.5809954	0.0968159	0.6500906	2.1216030	2.2094936	1.3329200	1.2862530					
160	0.8730594	0.8730590	1.0225878	0.8300267	0.2718720	-0.0336965	-0.0234898	0.3055685	0.1555993	0.5122765	0.7853981	3.1700926
	1.5797482	0.0971999	0.6496733	2.1215963	2.2098398	1.3321113	1.2851381					
161	0.8722755	0.8722756	1.0222902	0.8290823	0.2715518	-0.0349787	-0.0243821	0.3065305	0.1561128	0.5122372	0.7853981	3.1594954
	1.5784975	0.0975838	0.6492561	2.1215906	2.2101870	1.3313036	1.2840271					
162	0.8712445	0.8712441	1.0219917	0.8281378	0.2712315	-0.0351968	-0.0245327	0.3064283	0.1567893	0.5121859	0.7853981	3.1606178
	1.5768681	0.0979673	0.6488389	2.1215829	2.2108574	1.3304948	1.2825775					
163	0.8706511	0.8706507	1.0216942	0.8271930	0.2709113	-0.0373902	-0.0260597	0.3083015	0.1571637	0.5121569	0.7853981	3.1401539
	1.5759411	0.0983508	0.6484206	2.1215782	2.2102289	1.3296871	1.2817535					
164	0.8696581	0.8696577	1.0213947	0.8262489	0.2705911	-0.0377189	-0.0262803	0.3083009	0.1578237	0.5121068	0.7853981	3.1401701
	1.5743456	0.0987257	0.6480029	2.1215706	2.2115688	1.3288784	1.2803364					
165	0.8650825	0.8650825	1.0210953	0.8253049	0.2702709	-0.0399361	-0.0278107	0.3102070	0.1581905	0.5120778	0.7853981	3.1195812
	1.5734301	0.0991192	0.6475849	2.1215668	2.2116388	1.3280696	1.2795229					
166	0.8680735	0.8680730	1.0207932	0.8243611	0.2699506	-0.0402225	-0.0280286	0.3101732	0.1588530	0.5120277	0.7853981	3.1199446
	1.5718241	0.0995035	0.6471673	2.1215591	2.2122793	1.3272600	1.2778972					
167	0.8672711	0.8672712	1.0204935	0.8234172	0.2696304	-0.0414396	-0.0288749	0.3110700	0.1593741	0.5119875	0.7853981	3.1103449
	1.5705450	0.0998777	0.6467487	2.1215534	2.2124474	1.3264522	1.2769642					
168	0.8664796	0.8664792	1.0201912	0.8224738	0.2693102	-0.0426998	-0.0297440	0.3120010	0.1598866	0.5119482	0.7853981	3.1004362
	1.5692862	0.1002615	0.6463309	2.1215497	2.2130241	1.3256425	1.2758446					
169	0.8656835	0.8656835	1.0198879	0.8215305	0.2689900	-0.0439297	-0.0306054	0.3129187	0.1604006	0.5119088	0.7853981	3.0907240
	1.5680180	0.1006452	0.6459129	2.1215419	2.2133656	1.3248319	1.2747202					
170	0.8648966	0.8648962	1.0195837	0.8205875	0.2686697	-0.0452011	-0.0314857	0.3138168	0.1609079	0.5118695	0.7853981	3.0807066
	1.5667625	0.1010291	0.6454951	2.1215391	2.2137156	1.3240223	1.2736173					
171	0.8641036	0.8641032	1.0192785	0.8196446	0.2683495	-0.0464634	-0.0323650	0.3148059	0.1614181	0.5118302	0.7853981	3.0708828
	1.5655012	0.1014126	0.6450773	2.1215324	2.2141694	1.3232127	1.2724867					

172	0.8633071	0.8633067	1.0189724	0.8187022	2.2680293	-0.0476882	-0.0332182	0.3157175	0.1619297	0.5117908	0.7853981	3.0614424
	1.2642290	0.1017559	0.6446597	2.1215286	2.2144327	1.2623791	1.2713614					
173	0.8625113	0.8625179	1.0186663	0.8177597	0.2677091	-0.0489563	-0.0340993	0.3166654	0.1624361	0.5117519	0.7853981	3.0516396
	1.2629711	0.1021758	0.6442415	2.1215225	2.2147837	1.2615885	1.2702465					
174	0.8617273	0.8617269	1.0183592	0.8168174	0.2673888	-0.0502113	-0.0349711	0.3176001	0.1629429	0.5117126	0.7853981	3.0420275
	1.2617054	0.1025635	0.6438234	2.1215191	2.2151394	1.2607779	1.2691288					
175	0.8609356	0.8609352	1.0180502	0.8158156	0.2670686	-0.0514629	-0.0358405	0.3185315	0.1634483	0.5116736	0.7853981	3.0325041
	1.2604458	0.1029466	0.6434059	2.1215143	2.2154951	1.2599653	1.2680101					
176	0.8601432	0.8601428	1.0177402	0.8149340	0.2667484	-0.0527776	-0.0367048	0.3194559	0.1639532	0.5116347	0.7853981	3.0231047
	1.2591793	0.1033256	0.6429884	2.1215096	2.2158518	1.2591518	1.2668896					
177	0.8593493	0.8593489	1.0174303	0.8139524	0.2664282	-0.0539520	-0.0375650	0.3203802	0.1644591	0.5115954	0.7853981	3.0137596
	1.2579126	0.1037129	0.6425705	2.1215048	2.2162104	1.2583403	1.2657681					
178	0.8585585	0.8585585	1.0171185	0.8130512	0.2661075	-0.0552086	-0.0384415	0.3213165	0.1649607	0.5115564	0.7853981	3.0043449
	1.2566502	0.1040957	0.6421530	2.1215000	2.2165632	1.2575258	1.2646513					
179	0.8577669	0.8577669	1.0168066	0.8121111	0.2657877	-0.0564459	-0.0393004	0.3222336	0.1654638	0.5115175	0.7853981	2.9951763
	1.2553818	0.1044788	0.6417353	2.1214972	2.2169228	1.2567133	1.2635307					
180	0.8569725	0.8569721	1.0164938	0.8111691	0.2654675	-0.0576860	-0.0401611	0.3231534	0.1659667	0.5114787	0.7853981	2.9860296
	1.2541134	0.1048618	0.6413174	2.1214924	2.2172813	1.2558985	1.2624092					
181	0.8561827	0.8561823	1.0161800	0.8102283	0.2651473	-0.0589445	-0.0410245	0.3240517	0.1664659	0.5114397	0.7853981	2.9767504
	1.2528517	0.1052448	0.6408997	2.1214886	2.2176352	1.2550854	1.2612934					
182	0.8553902	0.8553898	1.0158644	0.8092891	0.2648270	-0.0601865	-0.0418962	0.3250135	0.1669651	0.5114012	0.7853981	2.9676857
	1.2515823	0.1056270	0.6404826	2.1214848	2.2179918	1.2542700	1.2601738					
183	0.8545979	0.8545979	1.0155487	0.8083477	0.2645068	-0.0614317	-0.0427602	0.3259385	0.1674638	0.5113623	0.7853981	2.9586391
	1.2503155	0.1060098	0.6400648	2.1214809	2.2183485	1.2534546	1.2590542					
184	0.8538076	0.8538067	1.0152321	0.8074074	0.2641866	-0.0626795	-0.0436257	0.3268660	0.1679611	0.5113238	0.7853981	2.9496174
	1.2490454	0.1063926	0.6396470	2.1214771	2.2187042	1.2526392	1.2579365					
185	0.8530135	0.8530135	1.0149145	0.8064678	0.2638664	-0.0639173	-0.0444842	0.3277836	0.1684587	0.5112849	0.7853981	2.9407496
	1.2477800	0.1067749	0.6392296	2.1214733	2.2190628	1.2518238	1.2568159					
186	0.8522212	0.8522208	1.0145969	0.8055279	0.2635461	-0.0651553	-0.0453428	0.3287014	0.1689559	0.5112460	0.7853981	2.9319096
	1.2465107	0.1071579	0.6388115	2.1214695	2.2194214	1.2510084	1.2556953					
187	0.8514287	0.8514284	1.0142775	0.8045886	0.2632259	-0.0663921	-0.0462003	0.3296180	0.1694511	0.5112075	0.7853981	2.9231377
	1.2452414	0.1075401	0.6383941	2.1214657	2.2197800	1.2501921	1.2545757					
188	0.8506352	0.8506352	1.0139570	0.8036492	0.2629057	-0.0676258	-0.0470555	0.3305314	0.1699458	0.5111690	0.7853981	2.9144421
	1.2439682	0.1079224	0.6379765	2.1214620	2.2201395	1.2493748	1.2534542					
189	0.8498456	0.8498446	1.0136356	0.8027104	0.2625855	-0.0688711	-0.0479187	0.3314566	0.1704277	0.5111306	0.7853981	2.9056826
	1.2427017	0.1083044	0.6375592	2.1214600	2.2204943	1.2485575	1.2523375					
190	0.8490542	0.8490542	1.0133133	0.8017715	0.2622652	-0.0701198	-0.0487842	0.3323850	0.1709287	0.5110921	0.7853981	2.8969393
	1.2414352	0.1086865	0.6371418	2.1214561	2.2208493	1.2477402	1.2512207					
191	0.8482614	0.8482610	1.0129900	0.8008331	0.2619450	-0.0713552	-0.0496403	0.3333002	0.1714203	0.5110536	0.7853981	2.8883657
	1.2401640	0.1090682	0.6367246	2.1214533	2.2212067	1.2469219	1.2501001					
192	0.8474677	0.8474673	1.0126657	0.7998946	0.2616248	-0.0725775	-0.0504870	0.3342022	0.1719115	0.5110151	0.7853981	2.8799610
	1.2388885	0.1094500	0.6363072	2.1214514	2.2215691	1.2461037	1.2489786					
193	0.8466752	0.8466748	1.0123415	0.7989562	0.2613046	-0.0738088	-0.0513399	0.3351133	0.1724018	0.5109771	0.7853981	2.8715143
	1.2376158	0.1098322	0.6358894	2.1214485	2.2219286	1.2452854	1.2478580					
194	0.8458841	0.8458838	1.0120153	0.7980179	0.2609843	-0.0750553	-0.0522032	0.3360356	0.1728853	0.5109386	0.7853981	2.8629732
	1.2363474	0.1102141	0.6354720	2.1214447	2.2222834	1.2444662	1.2467403					
195	0.8450937	0.8450934	1.0116892	0.7970802	0.2606641	-0.0762922	-0.0530599	0.3369563	0.1733762	0.5109006	0.7853981	2.8545656
	1.2350761	0.1105959	0.6350544	2.1214437	2.2226410	1.2436470	1.2456236					
196	0.8443001	0.8443004	1.0113611	0.7961426	0.2603439	-0.0775223	-0.0539116	0.3378662	0.1738630	0.5108621	0.7853981	2.8462629
	1.2338035	0.1109773	0.6346373	2.1214389	2.2229996	1.2428268	1.2445033					
197	0.8435068	0.8435061	1.0110321	0.7952055	0.2600237	-0.0787516	-0.0547625	0.3387753	0.1743482	0.5108240	0.7853981	2.8380098
	1.2325298	0.1113585	0.6342203	2.1214380	2.2233582	1.2420057	1.2433834					
198	0.8427156	0.8427153	1.0107021	0.7942685	0.2597035	-0.0799777	-0.0556111	0.3396811	0.1748329	0.5107860	0.7853981	2.8298292
	1.2312546	0.1117356	0.6338033	2.1214361	2.2237186	1.2411856	1.2422628					
199	0.8419222	0.8419218	1.0103722	0.7933313	0.2593833	-0.0812033	-0.0564593	0.3405865	0.1753181	0.5107479	0.7853981	2.8216934
	1.2299787	0.1121212	0.6333857	2.1214342	2.2240782	1.2403645	1.2411421					
200	0.8411306	0.8411303	1.0100412	0.7923942	0.2590631	-0.0824281	-0.0573137	0.3414911	0.1758019	0.5107098	0.7853981	2.8135185
	1.2287056	0.1125029	0.6329680	2.1214323	2.2244378	1.2395433	1.2400236					
201	0.8403355	0.8403355	1.0097094	0.7914575	0.2587428	-0.0836718	-0.0581672	0.3424146	0.1762823	0.5106718	0.7853981	2.8053951
	1.2274334	0.1128843	0.6325505	2.1214314	2.2247934	1.2387222	1.2389059					
202	0.8395478	0.8395475	1.0093765	0.7905218	0.2584226	-0.0849158	-0.0590209	0.3433284	0.1767637	0.5106338	0.7853981	2.7973108
	1.2261582	0.1132654	0.6321329	2.1214285	2.2251511	1.2378932	1.2377863					
203	0.8387535	0.8387535	1.0090427	0.7895845	0.2581024	-0.0861601	-0.0598606	0.3442225	0.1772453	0.5105961	0.7853981	2.7894402
	1.2248795	0.1136468	0.6317155	2.1214266	2.2255144	1.2370771	1.2366648					
204	0.8379626	0.8379624	1.0087080	0.7886482	0.2577821	-0.0873960	-0.0607153	0.3451391	0.1777239	0.5105581	0.7853981	2.7814198
	1.2236052	0.1140280	0.6312980	2.1214256	2.2258711	1.2362541	1.2355471					
205	0.8371676	0.8371673	1.0083733	0.7877122	0.2574619	-0.0886225	-0.0615521	0.3460484	0.1782054	0.5105200	0.7853981	2.7736616
	1.2223255	0.1144095	0.6308801	2.1214237	2.2262354	1.2354321	1.2344236					
206	0.8363756	0.8363749	1.0080366	0.7867764	0.2571416	-0.0898349	-0.0624012	0.3469366	0.1786830	0.5104825	0.7853981	2.7657862
	1.2210498	0.1147906	0.6304626	2.1214218	2.2265943	1.2346101	1.2333141					
207	0.8355836	0.8355833	1.0077000	0.7858406	0.2568215	-0.0910167	-0.0632455	0.3478381	0.1791602	0.5104449	0.7853981	2.7580080
	1.2197716	0.1151720	0.6300447	2.1214218	2.2269545	1.2337941	1.2321454					

208	0.8347901	0.8347857	1.0073614	0.7849051	0.2565014	-0.0922387	-0.0640901	0.3487399	0.1796367	0.5104068	0.7853981	2.7592651
	1.5184937	0.1155528	0.6296213	2.1214199	2.2273140	1.3329601	1.2310638					
209	0.8339993	0.8339589	1.0070225	0.7839695	0.2561819	-0.0934722	-0.0649424	0.3496532	0.1801113	0.5103692	0.7853981	2.7424631
	1.5172188	0.1159341	0.6292093	2.1214180	2.2276716	1.3321352	1.2299461					
210	0.8332052	0.8332049	1.0066824	0.7830343	0.2558607	-0.0946835	-0.0657790	0.3505442	0.1805863	0.5103316	0.7853981	2.7348900
	1.5159345	0.1163149	0.6287918	2.1214189	2.2283350	1.3313093	1.2288237					
211	0.8324152	0.8324148	1.0063410	0.7820995	0.2555405	-0.0959128	-0.0666280	0.3514534	0.1810575	0.5102943	0.7853981	2.7271996
	1.5146608	0.1166955	0.6283746	2.1214170	2.2289916	1.3304834	1.2277079					
212	0.8316221	0.8316217	1.0059986	0.7811650	0.2552203	-0.0971327	-0.0674704	0.3523530	0.1815298	0.5102567	0.7853981	2.7196274
	1.5133810	0.1170759	0.6279573	2.1214161	2.2287521	1.3296576	1.2265873					
213	0.8308287	0.8308287	1.0056562	0.7802392	0.2549001	-0.0983489	-0.0683101	0.3532490	0.1820021	0.5102191	0.7853981	2.7121229
	1.5121002	0.1174567	0.6275395	2.1214161	2.2291136	1.3288317	1.2254667					
214	0.8300343	0.8300343	1.0053129	0.7792956	0.2545798	-0.0995552	-0.0691428	0.3541350	0.1824743	0.5101815	0.7853981	2.7047167
	1.5108156	0.1178377	0.6271215	2.1214161	2.2294779	1.3280048	1.2243443					
215	0.8292428	0.8292422	1.0049686	0.7783613	0.2542596	-0.1007735	-0.0699837	0.3550331	0.1829441	0.5101443	0.7853981	2.6972876
	1.5095356	0.1182184	0.6267037	2.1214151	2.2298384	1.3271780	1.2232246					
216	0.8284516	0.8284513	1.0046234	0.7774272	0.2539394	-0.1019972	-0.0708280	0.3559366	0.1834120	0.5101071	0.7853981	2.6898289
	1.5082565	0.1185991	0.6262860	2.1214151	2.2301970	1.3263512	1.2221069					
217	0.8276555	0.8276555	1.0042763	0.7764934	0.2536192	-0.1032124	-0.0716594	0.3568216	0.1838813	0.5100695	0.7853981	2.6825581
	1.5069704	0.1189792	0.6258687	2.1214142	2.2305613	1.3255224	1.2209826					
218	0.8268632	0.8268630	1.0039291	0.7755595	0.2532989	-0.1044194	-0.0724992	0.3577183	0.1843484	0.5100323	0.7853981	2.6752253
	1.5056896	0.1193597	0.6254508	2.1214142	2.2309217	1.3246937	1.2198629					
219	0.8260697	0.8260693	1.0035820	0.7746258	0.2529787	-0.1056231	-0.0733293	0.3586019	0.1848163	0.5099950	0.7853981	2.6680359
	1.5044141	0.1197406	0.6250326	2.1214151	2.2312863	1.3238659	1.2187414					
220	0.8252787	0.8252783	1.0032320	0.7736922	0.2526585	-0.1068451	-0.0741719	0.3595036	0.1852795	0.5099579	0.7853981	2.6607323
	1.5031242	0.1201208	0.6246151	2.1214151	2.2316446	1.3230362	1.2176237					
221	0.8244846	0.8244842	1.0028830	0.7727591	0.2523383	-0.1080514	-0.0750036	0.3603857	0.1857457	0.5099207	0.7853981	2.6535502
	1.5018387	0.1205013	0.6241971	2.1214151	2.2320000	1.3222075	1.2165012					
222	0.8236933	0.8236929	1.0025320	0.7718256	0.2520181	-0.1092756	-0.0758474	0.3612936	0.1862082	0.5098835	0.7853981	2.6463385
	1.5005585	0.1208818	0.6237791	2.1214151	2.2323666	1.3213778	1.2153835					
223	0.8229002	0.8228979	1.0021811	0.7708527	0.2516978	-0.1104714	-0.0766716	0.3621653	0.1866732	0.5098463	0.7853981	2.6393471
	1.4992784	0.1212623	0.6233605	2.1214161	2.2327328	1.3205481	1.2142601					
224	0.8221033	0.8221030	1.0018282	0.7699556	0.2513776	-0.1116762	-0.0775017	0.3630537	0.1871362	0.5098091	0.7853981	2.6323175
	1.4979836	0.1216425	0.6229429	2.1214161	2.2330971	1.3197165	1.2131367					
225	0.8213123	0.8213120	1.0014753	0.7690270	0.2510574	-0.1128896	-0.0783378	0.3639470	0.1875964	0.5097724	0.7853981	2.6252518
	1.4966953	0.1220231	0.6225247	2.1214180	2.2334576	1.3188858	1.2120190					
226	0.8205196	0.8205186	1.0011206	0.7680947	0.2507371	-0.1140934	-0.0791669	0.3648306	0.1880564	0.5097352	0.7853981	2.6182547
	1.4954128	0.1224030	0.6221070	2.1214190	2.2338209	1.3180542	1.2108974					
227	0.8197258	0.8197255	1.0007648	0.7671627	0.2504169	-0.1153125	-0.0799996	0.3657154	0.1885152	0.5096984	0.7853981	2.6113291
	1.4941272	0.1227826	0.6216894	2.1214190	2.2341824	1.3172216	1.2097769					
228	0.8189327	0.8189324	1.0004091	0.7662301	0.2500967	-0.1165150	-0.0808346	0.3666117	0.1889741	0.5096613	0.7853981	2.6043673
	1.4928411	0.1231632	0.6212709	2.1214199	2.2345439	1.3163900	1.2086563					
229	0.8181387	0.8181383	1.0000515	0.7652983	0.2497765	-0.1177137	-0.0816597	0.3674902	0.1894316	0.5096245	0.7853981	2.5975456
	1.4915532	0.1235428	0.6208531	2.1214218	2.2349081	1.3155565	1.2075348					
230	0.8173447	0.8173443	0.9996947	0.7643659	0.2494562	-0.1189128	-0.0824851	0.3683690	0.1898901	0.5095878	0.7853981	2.5907536
	1.4902635	0.1239238	0.6204340	2.1214228	2.2352734	1.3147249	1.2064121					
231	0.8165489	0.8165486	0.9993373	0.7634339	0.2491360	-0.1201075	-0.0833072	0.3692436	0.1903490	0.5095510	0.7853981	2.5840244
	1.4889717	0.1243043	0.6200153	2.1214237	2.2356396	1.3138914	1.2052879					
232	0.8157566	0.8157563	0.9989788	0.7625015	0.2488158	-0.1213115	-0.0841356	0.3701273	0.1908047	0.5095143	0.7853981	2.5772552
	1.4876852	0.1246853	0.6195960	2.1214256	2.2360039	1.3130509	1.2041683					
233	0.8149657	0.8149653	0.9986191	0.7615702	0.2484956	-0.1225243	-0.0849701	0.3710099	0.1912589	0.5094779	0.7853981	2.5704489
	1.4863987	0.1250657	0.6191773	2.1214295	2.2363644	1.3122253	1.2030506					
234	0.8141680	0.8141676	0.9982594	0.7606386	0.2481753	-0.1237057	-0.0857825	0.3718810	0.1917159	0.5094407	0.7853981	2.5639133
	1.4851127	0.1254466	0.6187579	2.1214294	2.2367253	1.3113918	1.2019234					
235	0.8133682	0.8133678	0.9978983	0.7597071	0.2478551	-0.1248740	-0.0865934	0.3727492	0.1921703	0.5093948	0.7853981	2.5643063
	1.4838276	0.1258171	0.6183389	2.1214323	2.2370867	1.3105574	1.2007110					
236	0.8125685	0.8125685	0.9975364	0.7587757	0.2475349	-0.1260574	-0.0873994	0.3735923	0.1926309	0.5093669	0.7853981	2.5510092
	1.4825044	0.1262075	0.6179194	2.1214323	2.2374792	1.3097229	1.1996641					
237	0.8115751	0.8115748	0.9971774	0.7578447	0.2472147	-0.1263499	-0.0875569	0.3736646	0.1932182	0.5093213	0.7853981	2.5512171
	1.4808874	0.1265776	0.6175009	2.1214361	2.2381229	1.3098465	1.1982603					
238	0.8107736	0.8107724	0.9966079	0.7569138	0.2468944	-0.1275392	-0.0883929	0.3744426	0.1936738	0.5092847	0.7853981	2.5449381
	1.4795828	0.1269575	0.6170819	2.1214380	2.2384996	1.3080511	1.1971273					
239	0.8099792	0.8099789	0.9964436	0.7559827	0.2465742	-0.1287054	-0.0892155	0.3752797	0.1941250	0.5092479	0.7853981	2.5383949
	1.4782908	0.1273383	0.6166622	2.1214405	2.2388649	1.3072147	1.1960049					
240	0.8091835	0.8091835	0.9960790	0.7550517	0.2462540	-0.1298935	-0.0900319	0.3761475	0.1945765	0.5092115	0.7853981	2.5319500
	1.4769955	0.1277190	0.6162425	2.1214437	2.2392330	1.3063784	1.1948814					
241	0.8083856	0.8083853	0.9957130	0.7541210	0.2459338	-0.1310714	-0.0908409	0.3770052	0.1950286	0.5091752	0.7853981	2.5256081
	1.4756947	0.1280999	0.6158225	2.1214457	2.2396049	1.3055420	1.1937532					
242	0.8075915	0.8075902	0.9953465	0.7531902	0.2456135	-0.1322617	-0.0916585	0.3778752	0.1954789	0.5091385	0.7853981	2.5192013
	1.4744005	0.1284806	0.6154026	2.1214485	2.2399771	1.3047056	1.1926298					
243	0.8067933	0.8067930	0.9949791	0.7522597	0.2452933	-0.1334416	-0.0924686	0.3787349	0.1959279	0.5091022	0.7853981	2.5128994
	1.4731016	0.1288615	0.6149825	2.1214514	2.2403431	1.3038683	1.1915035					

244	0.8059981	0.8059978	0.9946108	0.7513294	0.2449731	-0.1346277	-0.0932829	0.3796008	0.1963755	0.5090659	0.7853981	2.5065804
	1.4718056	0.1292424	0.6145623	2.1214542	2.2407112	1.2033310	1.1593801					
245	0.8052021	0.8052021	0.9942417	0.7503592	0.2446529	-0.1358130	-0.0940965	0.3804659	0.1968228	0.5090296	0.7853981	2.5002928
	1.4705086	0.1296232	0.6141422	2.1214571	2.2410993	1.2021936	1.1892557					
246	0.8044053	0.8044050	0.9938710	0.7494686	0.2443326	-0.1369219	-0.0949056	0.3813245	0.1972654	0.5089933	0.7853981	2.4940796
	1.4692078	0.1300039	0.6137220	2.1214609	2.2414503	1.2013544	1.1881294					
247	0.8036084	0.8036087	0.9935014	0.7485986	0.2440124	-0.1381636	-0.0957094	0.3821760	0.1977170	0.5089569	0.7853981	2.4879446
	1.4679075	0.1303856	0.6133008	2.1214638	2.2418242	1.2005171	1.1870031					
248	0.8028110	0.8028107	0.9931298	0.7476685	0.2436922	-0.1393383	-0.0965152	0.3830304	0.1981628	0.5089210	0.7853981	2.4818144
	1.4666052	0.1307663	0.6128804	2.1214676	2.2421961	1.2996778	1.1858759					
249	0.8020146	0.8020142	0.9927568	0.7466789	0.2433721	-0.1405215	-0.0973267	0.3838934	0.1986066	0.5088847	0.7853981	2.4756458
	1.4653063	0.1311470	0.6124601	2.1214705	2.2425652	1.2988377	1.1847506					
250	0.8012186	0.8012180	0.9923835	0.7457490	0.2430517	-0.1417043	-0.0981378	0.3847561	0.1990500	0.5088488	0.7853981	2.4695129
	1.4640064	0.1315278	0.6120394	2.1214743	2.2429342	1.2979975	1.1836262					
251	0.8004230	0.8004227	0.9920084	0.7448198	0.2427315	-0.1428836	-0.0989463	0.3856151	0.1994909	0.5088125	0.7853981	2.4634275
	1.4627075	0.1319084	0.6116191	2.1214781	2.2433033	1.2971573	1.1825018					
252	0.7996245	0.7996245	0.9916334	0.7438902	0.2424113	-0.1440532	-0.0997480	0.3864645	0.1999339	0.5087766	0.7853981	2.4574366
	1.4614038	0.1322855	0.6111980	2.1214819	2.2436771	1.2963171	1.1813745					
253	0.7988287	0.7988284	0.9912576	0.7429609	0.2420911	-0.1452249	-0.1005509	0.3873159	0.2003748	0.5087407	0.7853981	2.4514561
	1.4601011	0.1326705	0.6107770	2.1214867	2.2440491	1.2954760	1.1802492					
254	0.7980305	0.7980301	0.9908798	0.7420320	0.2417708	-0.1464029	-0.1013581	0.3881737	0.2008149	0.5087044	0.7853981	2.4454556
	1.4587984	0.1330509	0.6103565	2.1214905	2.2444191	1.2946339	1.1791229					
255	0.7972344	0.7972340	0.9905012	0.7411031	0.2414506	-0.1475770	-0.1021624	0.3890276	0.2012529	0.5086688	0.7853981	2.4395075
	1.4574957	0.1334313	0.6099355	2.1214943	2.2447901	1.2937908	1.1779966					
256	0.7964367	0.7964364	0.9901220	0.7401741	0.2411304	-0.1487532	-0.1029678	0.3898836	0.2016914	0.5086326	0.7853981	2.4335699
	1.4561920	0.1338120	0.6095150	2.1214981	2.2451611	1.2929470	1.1768694					
257	0.7956393	0.7956390	0.9897419	0.7392455	0.2408101	-0.1499205	-0.1037672	0.3907306	0.2021287	0.5085971	0.7853981	2.4277191
	1.4548874	0.1341923	0.6090944	2.1215029	2.2455339	1.2921047	1.1757431					
258	0.7948416	0.7948412	0.9893609	0.7383168	0.2404899	-0.1510840	-0.1045637	0.3915739	0.2025655	0.5085613	0.7853981	2.4219170
	1.4535795	0.1345732	0.6086731	2.1215096	2.2459087	1.2912617	1.1746159					
259	0.7940460	0.7940456	0.9889792	0.7373885	0.2401696	-0.1522659	-0.1053720	0.3924346	0.2030000	0.5085254	0.7853981	2.4160194
	1.4522791	0.1349538	0.6082520	2.1215124	2.2462769	1.2904177	1.1734915					
260	0.7932482	0.7932479	0.9885960	0.7364601	0.2398494	-0.1534272	-0.1061673	0.3932767	0.2034345	0.5084899	0.7853981	2.4102745
	1.4509766	0.1353341	0.6078311	2.1215181	2.2466537	1.2895727	1.1723642					
261	0.7924515	0.7924516	0.9882109	0.7355322	0.2395292	-0.1545806	-0.1069773	0.3941398	0.2038661	0.5084540	0.7853981	2.4044985
	1.4496698	0.1357138	0.6074107	2.1215219	2.2470179	1.2887268	1.1712399					
262	0.7916505	0.7916502	0.9878272	0.7346039	0.2392090	-0.1557564	-0.1077607	0.3949654	0.2043026	0.5084184	0.7853981	2.3988218
	1.4483547	0.1360949	0.6069888	2.1215277	2.2473984	1.2878815	1.1701069					
263	0.7908531	0.7908534	0.9874422	0.7336755	0.2388887	-0.1569327	-0.1085652	0.3958214	0.2047347	0.5083826	0.7853981	2.3930521
	1.4470501	0.1364758	0.6065671	2.1215324	2.2477684	1.2870359	1.1689816					
264	0.7900555	0.7900555	0.9870568	0.7327476	0.2385685	-0.1580957	-0.1093603	0.3966642	0.2051672	0.5083472	0.7853981	2.3873540
	1.4457426	0.1368569	0.6061451	2.1215382	2.2481422	1.2861910	1.1678543					
265	0.7892591	0.7892588	0.9866709	0.7318195	0.2382483	-0.1592587	-0.1101553	0.3975070	0.2055983	0.5083117	0.7853981	2.3817596
	1.4444342	0.1372382	0.6057228	2.1215439	2.2485177	1.2853451	1.1667280					
266	0.7884628	0.7884624	0.9862825	0.7308919	0.2379281	-0.1604207	-0.1109495	0.3983488	0.2060285	0.5082762	0.7853981	2.3761530
	1.4431248	0.1376187	0.6053013	2.1215496	2.2488959	1.2844973	1.1655998					
267	0.7876664	0.7876660	0.9858944	0.7299641	0.2376078	-0.1615767	-0.1117455	0.3991845	0.2064596	0.5082407	0.7853981	2.3706093
	1.4418106	0.1379998	0.6048789	2.1215553	2.2492676	1.2836504	1.1644688					
268	0.7868721	0.7868717	0.9855057	0.7290363	0.2372876	-0.1627307	-0.1125346	0.4000283	0.2068890	0.5082053	0.7853981	2.3650351
	1.4405022	0.1383810	0.6044565	2.1215601	2.2496414	1.2828026	1.1633415					
269	0.7860777	0.7860774	0.9851157	0.7281089	0.2369674	-0.1638814	-0.1133274	0.4008688	0.2073165	0.5081698	0.7853981	2.3595047
	1.4391928	0.1387625	0.6040337	2.1215668	2.2500152	1.2819557	1.1622143					
270	0.7852677	0.7852673	0.9847246	0.7271818	0.2366472	-0.1650276	-0.1141238	0.4017148	0.2077426	0.5081348	0.7853981	2.3539600
	1.4378834	0.1391430	0.6036118	2.1215725	2.2503891	1.2811069	1.1610980					
271	0.7844660	0.7844676	0.9843329	0.7262545	0.2363269	-0.1662240	-0.1149132	0.4025509	0.2081691	0.5080993	0.7853981	2.3485012
	1.4365711	0.1395243	0.6031893	2.1215752	2.2507648	1.2802582	1.1599588					
272	0.7836687	0.7836683	0.9839395	0.7253275	0.2360067	-0.1673771	-0.1157023	0.4033838	0.2085944	0.5080638	0.7853981	2.3430853
	1.4352575	0.1399044	0.6027673	2.1215849	2.2511426	1.2794075	1.1588287					
273	0.7828705	0.7828705	0.9835452	0.7244002	0.2356865	-0.1685346	-0.1164930	0.4042251	0.2090191	0.5080287	0.7853981	2.3376960
	1.4339466	0.1402860	0.6023440	2.1215916	2.2515154	1.2785587	1.1577024					
274	0.7820704	0.7820700	0.9831517	0.7234731	0.2353663	-0.1696906	-0.1172790	0.4050569	0.2094452	0.5079933	0.7853981	2.3322687
	1.4326305	0.1406674	0.6019208	2.1215982	2.2518933	1.2777090	1.1565704					
275	0.7812735	0.7812735	0.9827557	0.7225463	0.2350460	-0.1708440	-0.1180726	0.4058801	0.2098662	0.5079583	0.7853981	2.3268499
	1.4313211	0.1410484	0.6014981	2.1216049	2.2522659	1.2768583	1.1554451					
276	0.7804766	0.7804762	0.9823591	0.7216197	0.2347258	-0.1719941	-0.1188638	0.4067000	0.2102870	0.5079232	0.7853981	2.3214741
	1.4300056	0.1414293	0.6010752	2.1216116	2.2526393	1.2760067	1.1543188					
277	0.7796797	0.7796793	0.9819621	0.7206932	0.2344056	-0.1731520	-0.1196395	0.4075176	0.2107114	0.5078881	0.7853981	2.3162584
	1.4286888	0.1418104	0.6006519	2.1216192	2.2529717	1.2751551	1.1531849					
278	0.7788853	0.7788849	0.9815638	0.7197664	0.2340854	-0.1743038	-0.1204295	0.4083962	0.2111313	0.5078532	0.7853981	2.3109322
	1.4273735	0.1421916	0.6002287	2.1216259	2.2533960	1.2743025	1.1520567					
279	0.7780756	0.7780752	0.9811663	0.7188395	0.2337651	-0.1754516	-0.1212152	0.4092287	0.2115531	0.5078181	0.7853981	2.3056641
	1.4260582	0.1425736	0.5998045	2.1216326	2.2537737	1.2734518	1.1509265					

280	0.7772774	0.7772771	0.9807664	0.7179132	0.2336449	-0.1766181	-0.1220019	0.4100630	0.2119713	0.5077831	0.7853981	2.3004036
	1.4247446	0.1429549	0.5993809	2.1216402	2.2541494	1.2725992	1.1497553					
281	0.7764766	0.7764763	0.9803658	0.7169871	0.2331247	-0.1777602	-0.1227798	0.4108849	0.2123905	0.5077481	0.7853981	2.2952433
	1.4234247	0.1433361	0.5989574	2.1216478	2.2545290	1.2717457	1.1486673					
282	0.7756779	0.7756775	0.9799643	0.7160611	0.2328045	-0.1789168	-0.1235676	0.4117213	0.2128075	0.5077134	0.7853981	2.2900095
	1.4221087	0.1437174	0.5985336	2.1216555	2.2549047	1.2708921	1.1475391					
283	0.7748750	0.7748786	0.9795619	0.7151346	0.2324942	-0.1800638	-0.1243486	0.4125461	0.2132239	0.5076783	0.7853981	2.2848568
	1.4207516	0.1440989	0.5981095	2.1216631	2.2552824	1.2700377	1.1464100					
284	0.7740783	0.7740780	0.9791584	0.7142085	0.2321643	-0.1812135	-0.1251314	0.4133775	0.2136402	0.5076437	0.7853981	2.2797079
	1.4193813	0.1444801	0.5976857	2.1216717	2.2556601	1.2691832	1.1452789					
285	0.7732767	0.7732763	0.9787540	0.7132831	0.2318439	-0.1823442	-0.1259008	0.4141880	0.2140563	0.5076087	0.7853981	2.2746935
	1.4181490	0.1448613	0.5972617	2.1216793	2.2560425	1.2683277	1.1441467					
286	0.7724775	0.7724776	0.9783478	0.7123576	0.2315236	-0.1834986	-0.1266863	0.4150221	0.2144687	0.5075741	0.7853981	2.2695541
	1.4168325	0.1452420	0.5968302	2.1216869	2.2564173	1.2674723	1.1430178					
287	0.7716766	0.7716762	0.9779410	0.7114315	0.2312033	-0.1846469	-0.1274677	0.4158502	0.2148824	0.5075394	0.7853981	2.2644691
	1.4159111	0.1456231	0.5964141	2.1216946	2.2567949	1.2666140	1.1418858					
288	0.7708765	0.7708765	0.9775353	0.7105050	0.2308831	-0.1857817	-0.1282394	0.4166648	0.2152959	0.5075048	0.7853981	2.2594872
	1.4141893	0.1460053	0.5959899	2.1217041	2.2571774	1.2657595	1.1417557					
289	0.7700753	0.7700749	0.9771272	0.7095804	0.2305629	-0.1869196	-0.1290131	0.4174824	0.2157083	0.5074702	0.7853981	2.2545042
	1.4129656	0.1463866	0.5955645	2.1217127	2.2575579	1.2649021	1.1396227					
290	0.7692735	0.7692736	0.9767189	0.7086557	0.2302427	-0.1880599	-0.1297984	0.4183025	0.2161204	0.5074352	0.7853981	2.2495251
	1.4115446	0.1467682	0.5951397	2.1217203	2.2579374	1.2640457	1.1384907					
291	0.7684745	0.7684745	0.9763193	0.7077296	0.2299224	-0.1892117	-0.1305713	0.4191341	0.2165257	0.5074010	0.7853981	2.2444954
	1.4102240	0.1471496	0.5947151	2.1217289	2.2583161	1.2631965	1.1373615					
292	0.7676744	0.7676741	0.9759093	0.7069042	0.2296022	-0.1903535	-0.1313472	0.4199557	0.2169395	0.5073663	0.7853981	2.2395439
	1.4089031	0.1475314	0.5942898	2.1217384	2.2586927	1.2623291	1.1362314					
293	0.7668724	0.7668724	0.9754879	0.7059789	0.2292820	-0.1914893	-0.1321199	0.4207713	0.2173488	0.5073317	0.7853981	2.2346468
	1.4075785	0.1479133	0.5938645	2.1217461	2.2590742	1.2614708	1.1350985					
294	0.7660701	0.7660701	0.9750761	0.7049536	0.2289618	-0.1926240	-0.1328895	0.4215858	0.2177581	0.5072972	0.7853981	2.2297726
	1.4062515	0.1482952	0.5934391	2.1217556	2.2594566	1.2606115	1.1339645					
295	0.7652677	0.7652659	0.9746633	0.7040285	0.2286415	-0.1937649	-0.1336643	0.4224064	0.2181649	0.5072629	0.7853981	2.2248821
	1.4049282	0.1486771	0.5931136	2.1217651	2.2598362	1.2597523	1.1328344					
296	0.7644681	0.7644678	0.9742492	0.7031035	0.2283213	-0.1948923	-0.1344296	0.4232136	0.2185718	0.5072283	0.7853981	2.2200880
	1.4036001	0.1490588	0.5925880	2.1217747	2.2602196	1.2588921	1.1317035					
297	0.7636684	0.7636684	0.9738348	0.7021787	0.2280011	-0.1960188	-0.1352702	0.4240419	0.2189766	0.5071940	0.7853981	2.2151861
	1.4022785	0.1494411	0.5921620	2.1217842	2.2605972	1.2580318	1.1305714					
298	0.7628667	0.7628667	0.9734190	0.7012539	0.2276809	-0.1971767	-0.1359031	0.4248574	0.2193816	0.5071598	0.7853981	2.2103758
	1.4009522	0.1498229	0.5917362	2.1217937	2.2609777	1.2571707	1.1294384					
299	0.7620652	0.7620648	0.9730017	0.7003289	0.2273606	-0.1983120	-0.1367503	0.4256726	0.2197852	0.5071257	0.7853981	2.2055874
	1.3996255	0.1502044	0.5913104	2.1218033	2.2613583	1.2563086	1.1283064					
300	0.7612610	0.7612606	0.9725952	0.6994046	0.2270404	-0.1994284	-0.1375974	0.4264688	0.2201911	0.5070911	0.7853981	2.2009268
	1.3982944	0.1505866	0.5908843	2.1218128	2.2617355	1.2554474	1.1271696					
301	0.7604606	0.7604603	0.9721668	0.6984798	0.2267202	-0.2005627	-0.1382766	0.4272828	0.2205926	0.5070573	0.7853981	2.1961775
	1.3969660	0.1509690	0.5904577	2.1218243	2.2621279	1.2545853	1.1260366					
302	0.7596600	0.7596596	0.9717473	0.6975553	0.2264001	-0.2017082	-0.1390533	0.4280882	0.2209931	0.5070230	0.7853981	2.1913405
	1.3956413	0.1513509	0.5900316	2.1218338	2.2625055	1.2537222	1.1249035					
303	0.7588587	0.7588583	0.9713258	0.6966317	0.2260797	-0.2028488	-0.1398125	0.4288855	0.2213936	0.5069888	0.7853981	2.1867447
	1.3943180	0.1517322	0.5896057	2.1218443	2.2628899	1.2528582	1.1237726					
304	0.7580574	0.7580574	0.9709045	0.6957065	0.2257595	-0.2039615	-0.1405803	0.4297210	0.2217940	0.5069547	0.7853981	2.1820555
	1.3929806	0.1521142	0.5891792	2.1218538	2.2632713	1.2519932	1.1226387					
305	0.7572536	0.7572532	0.9704826	0.6947823	0.2254393	-0.2050964	-0.1413451	0.4305356	0.2221913	0.5069209	0.7853981	2.1773710
	1.3916521	0.1524962	0.5887526	2.1218653	2.2636528	1.2511292	1.1215476					
306	0.7564485	0.7564485	0.9700602	0.6938580	0.2251191	-0.2062126	-0.1421051	0.4313316	0.2225924	0.5068867	0.7853981	2.1728086
	1.3903175	0.1528790	0.5883251	2.1218758	2.2640400	1.2502651	1.1203709					
307	0.7556465	0.7556466	0.9696369	0.6929338	0.2247989	-0.2073432	-0.1428707	0.4321420	0.2229902	0.5068526	0.7853981	2.1681805
	1.3889885	0.1532615	0.5878978	2.1218863	2.2644224	1.2494001	1.1192379					
308	0.7548446	0.7548444	0.9692115	0.6920096	0.2244786	-0.2084764	-0.1436378	0.4329550	0.2233859	0.5068187	0.7853981	2.1635532
	1.3876581	0.1536435	0.5874709	2.1218967	2.2648035	1.2485342	1.1181049					
309	0.7540425	0.7540422	0.9687855	0.6910856	0.2241583	-0.2095910	-0.1443522	0.4337454	0.2237826	0.5067849	0.7853981	2.1590481
	1.3863211	0.1540257	0.5870437	2.1219082	2.2651911	1.2476673	1.1169682					
310	0.7532371	0.7532368	0.9683605	0.6901614	0.2238382	-0.2107200	-0.1451561	0.4345582	0.2241798	0.5067508	0.7853981	2.1544781
	1.3849888	0.1544086	0.5866156	2.1219196	2.2655745	1.2468004	1.1158333					
311	0.7524338	0.7524335	0.9679338	0.6892374	0.2235179	-0.2118425	-0.1459155	0.4353604	0.2245751	0.5067169	0.7853981	2.1499596
	1.3836546	0.1547917	0.5861873	2.1219311	2.2659597	1.2459335	1.1146884					
312	0.7516285	0.7516285	0.9675068	0.6883132	0.2231977	-0.2129525	-0.1466662	0.4361502	0.2249714	0.5066831	0.7853981	2.1455269
	1.3823166	0.1551749	0.5857588	2.1219425	2.2663488	1.2450676	1.1135607					
313	0.7508254	0.7508251	0.9670780	0.6873896	0.2228774	-0.2140735	-0.1474240	0.4369510	0.2253647	0.5066494	0.7853981	2.1410465
	1.3809824	0.1555578	0.5853305	2.1219540	2.2667341	1.2441998	1.1124258					
314	0.7500228	0.7500221	0.9666485	0.6864656	0.2225572	-0.2151905	-0.1481869	0.4377578	0.2257571	0.5066156	0.7853981	2.1365490
	1.3796482	0.1559406	0.5849022	2.1219664	2.2671175	1.2433319	1.1112919					
315	0.7492183	0.7492181	0.9662186	0.6855417	0.2222370	-0.2163146	-0.1488388	0.4385515	0.2261499	0.5065818	0.7853981	2.1321402
	1.3783112	0.1563239	0.5844734	2.1219778	2.2675056	1.2424631	1.1101551					

316	0.7484145	0.7484146	0.9657865	0.6846191	0.2219168	-0.2174371	-0.1496972	0.4393539	0.2265409	0.5065685	0.7853981	2.1276979
	1.3769741	0.1567066	0.5840449	2.1219502	2.2678900	1.2415924	1.1099202					
317	0.7476112	0.7476110	0.9653551	0.6836543	0.2215965	-0.2185563	-0.1504533	0.4401528	0.2269310	0.5065146	0.7853981	2.1232991
	1.3756390	0.1570904	0.5836153	2.1220026	2.2682772	1.2407246	1.1078854					
318	0.7468067	0.7468064	0.9649224	0.6827709	0.2212763	-0.2196746	-0.1512085	0.4409510	0.2273214	0.5064809	0.7853981	2.1189003
	1.3743010	0.1574736	0.5831862	2.1220140	2.2686625	1.2398539	1.1057486					
319	0.7460027	0.7460023	0.9644875	0.6818473	0.2209561	-0.2207925	-0.1519632	0.4417486	0.2277092	0.5064475	0.7853981	2.1145287
	1.3729630	0.1578564	0.5827573	2.1220264	2.2690487	1.2389822	1.1036128					
320	0.7451551	0.7451588	0.9640531	0.6809238	0.2206359	-0.2219111	-0.1527177	0.4425460	0.2280971	0.5064142	0.7853981	2.1101732
	1.3716240	0.1582402	0.5823274	2.1220388	2.2694359	1.2381115	1.1014769					
321	0.7443544	0.7443541	0.9636172	0.6800005	0.2203156	-0.2230208	-0.1534671	0.4433364	0.2284845	0.5063804	0.7853981	2.1058702
	1.3702850	0.1586236	0.5818979	2.1220522	2.2698240	1.2372408	1.0993401					
322	0.7435908	0.7435905	0.9631796	0.6790773	0.2199954	-0.2241407	-0.1542281	0.4441441	0.2288693	0.5063470	0.7853981	2.1014881
	1.3689460	0.1590065	0.5814686	2.1220646	2.2702174	1.2363672	1.0972053					
323	0.7427843	0.7427843	0.9627418	0.6781535	0.2196752	-0.2252465	-0.1549685	0.4449217	0.2292558	0.5063137	0.7853981	2.0972834
	1.3676033	0.1593901	0.5810387	2.1220779	2.2705994	1.2354946	1.0950656					
324	0.7419811	0.7419808	0.9623035	0.6772307	0.2193551	-0.2263674	-0.1557243	0.4457223	0.2296399	0.5062803	0.7853981	2.0929689
	1.3662643	0.1597736	0.5806086	2.1220913	2.2709846	1.2346210	1.0929308					
325	0.7411725	0.7411725	0.9618637	0.6763074	0.2190347	-0.2274644	-0.1564639	0.4464991	0.2300259	0.5062469	0.7853981	2.0887557
	1.3649166	0.1601571	0.5801784	2.1221046	2.2713776	1.2337475	1.0907892					
326	0.7403667	0.7403663	0.9614241	0.6753841	0.2187145	-0.2285724	-0.1572106	0.4472869	0.2304106	0.5062136	0.7853981	2.0845776
	1.3635731	0.1605411	0.5797476	2.1221180	2.2717676	1.2328739	1.0976496					
327	0.7395633	0.7395630	0.9609832	0.6744610	0.2183943	-0.2296884	-0.1579626	0.4480827	0.2307922	0.5061802	0.7853981	2.0803318
	1.3622332	0.1609253	0.5793166	2.1221313	2.2721548	1.2319994	1.0965147					
328	0.7387567	0.7387563	0.9605406	0.6735380	0.2180741	-0.2307951	-0.1587081	0.4488692	0.2311743	0.5061469	0.7853981	2.0761480
	1.3608988	0.1613089	0.5788860	2.1221447	2.2725449	1.2311239	1.0943751					
329	0.7379453	0.7379489	0.9600981	0.6726148	0.2177538	-0.2318980	-0.1594507	0.4496518	0.2315570	0.5061135	0.7853981	2.0719986
	1.3595619	0.1616932	0.5784546	2.1221580	2.2729359	1.2302485	1.0942345					
330	0.7371447	0.7371444	0.9596540	0.6716920	0.2174336	-0.2330039	-0.1601953	0.4504375	0.2319362	0.5060806	0.7853981	2.0678463
	1.3581574	0.1620770	0.5780237	2.1221713	2.2733259	1.2293720	1.0930977					
331	0.7363368	0.7363364	0.9592102	0.6707688	0.2171134	-0.2340999	-0.1609329	0.4512132	0.2323180	0.5060472	0.7853981	2.0637598
	1.3568487	0.1624618	0.5775915	2.1221876	2.2737198	1.2284966	1.0919561					
332	0.7355320	0.7355316	0.9587634	0.6699462	0.2167932	-0.2352194	-0.1616865	0.4520126	0.2326947	0.5060143	0.7853981	2.0595627
	1.3555055	0.1628452	0.5771608	2.1222010	2.2741051	1.2276182	1.0908194					
333	0.7347261	0.7347264	0.9583170	0.6690232	0.2164729	-0.2363262	-0.1624311	0.4527991	0.2330722	0.5059813	0.7853981	2.0554466
	1.3541602	0.1632296	0.5767289	2.1222153	2.2744942	1.2267399	1.0896816					
334	0.7339198	0.7339192	0.9578699	0.6680995	0.2161527	-0.2374234	-0.1631689	0.4535761	0.2334502	0.5059484	0.7853981	2.0513945
	1.3528116	0.1636140	0.5762965	2.1222315	2.2748871	1.2258625	1.0885421					
335	0.7331115	0.7331115	0.9574214	0.6671776	0.2158325	-0.2385201	-0.1639063	0.4543526	0.2338274	0.5059150	0.7853981	2.0473566
	1.3514624	0.1639987	0.5758646	2.1222448	2.2752810	1.2249842	1.0874004					
336	0.7323043	0.7323039	0.9569727	0.6661547	0.2155123	-0.2396221	-0.1646471	0.4551344	0.2342042	0.5058820	0.7853981	2.0433035
	1.3501133	0.1643834	0.5754320	2.1222591	2.2756720	1.2241049	1.0862598					
337	0.7314956	0.7314954	0.9565224	0.6652321	0.2151920	-0.2407327	-0.1653935	0.4559247	0.2345774	0.5058495	0.7853981	2.0392208
	1.3487673	0.1647680	0.5749995	2.1222744	2.2760611	1.2232256	1.0851231					
338	0.7305221	0.7305217	0.9560715	0.6643096	0.2148718	-0.2418533	-0.1660928	0.4566251	0.2349672	0.5058097	0.7853981	2.0392179
	1.3471327	0.1651425	0.5745669	2.1222925	2.2767019	1.2223454	1.0837421					
339	0.7298765	0.7298761	0.9556212	0.6633866	0.2145516	-0.2428896	-0.1668423	0.4574412	0.2353328	0.5057833	0.7853981	2.0314217
	1.3460522	0.1655379	0.5741329	2.1223059	2.2768602	1.2214661	1.0828295					
340	0.7289062	0.7289058	0.9551686	0.6624639	0.2142314	-0.2432481	-0.1670771	0.4574795	0.2358161	0.5057439	0.7853981	2.0312262
	1.3444256	0.1659136	0.5736992	2.1223240	2.2774897	1.2205849	1.0814590					
341	0.7282602	0.7282598	0.9547161	0.6615409	0.2139111	-0.2451764	-0.1683105	0.4589875	0.2360759	0.5057174	0.7853981	2.0235186
	1.3433477	0.1663080	0.5732653	2.1223364	2.2776489	1.2197037	1.0805464					
342	0.7272871	0.7272868	0.9542620	0.6606195	0.2135909	-0.2454256	-0.1685388	0.4590166	0.2365634	0.5056780	0.7853981	2.0233707
	1.3417206	0.1666843	0.5728315	2.1223545	2.2782822	1.2139225	1.0791721					
343	0.7264770	0.7264767	0.9538067	0.6596957	0.2132707	-0.2465033	-0.1692659	0.4597799	0.2369356	0.5056454	0.7853981	2.0194883
	1.3403618	0.1670698	0.5723972	2.1223717	2.2786808	1.2179394	1.0780277					
344	0.7256668	0.7256663	0.9533514	0.6587733	0.2129505	-0.2475053	-0.1699946	0.4605458	0.2373079	0.5056125	0.7853981	2.0156059
	1.3390045	0.1674552	0.5719630	2.1223879	2.2790775	1.2170572	1.0768824					
345	0.7248569	0.7248566	0.9528949	0.6578505	0.2126302	-0.2486774	-0.1707292	0.4613178	0.2376786	0.5055799	0.7853981	2.0117540
	1.2376474	0.1678414	0.5715278	2.1224041	2.2794762	1.2161741	1.0757389					
346	0.7240476	0.7240472	0.9524381	0.6569279	0.2123100	-0.2497742	-0.1714558	0.4620842	0.2380488	0.5055470	0.7853981	2.0078402
	1.2362923	0.1682276	0.5710926	2.1224194	2.2798710	1.2152910	1.0745955					
347	0.7232378	0.7232374	0.9519813	0.6560052	0.2119898	-0.2508564	-0.1721905	0.4628451	0.2384194	0.5055146	0.7853981	2.0040178
	1.2349342	0.1686144	0.5706566	2.1224365	2.2802706	1.2144179	1.0734510					
348	0.7224275	0.7224275	0.9515221	0.6550825	0.2116696	-0.2519430	-0.1729187	0.4636115	0.2387876	0.5054820	0.7853981	2.0001793
	1.2335752	0.1690003	0.5702215	2.1224537	2.2806673	1.2135225	1.0723066					
349	0.7216182	0.7216178	0.9510630	0.6541598	0.2113493	-0.2530220	-0.1736322	0.4643713	0.2391559	0.5054494	0.7853981	1.9963865
	1.2322176	0.1693872	0.5697852	2.1224659	2.2810664	1.2126389	1.0711532					
350	0.7208085	0.7208081	0.9506032	0.6532371	0.2110291	-0.2541105	-0.1743614	0.4651396	0.2395234	0.5054169	0.7853981	1.9925613
	1.2308601	0.1697744	0.5693486	2.1224871	2.2814646	1.2117548	1.0700197					
351	0.7199989	0.7199979	0.9501423	0.6523143	0.2107089	-0.2551950	-0.1750875	0.4659038	0.2398902	0.5053844	0.7853981	1.9887695
	1.2295052	0.1701611	0.5689123	2.1225042	2.2818632	1.2108679	1.0688744					

352	0.7191888	0.7151882	0.9496808	0.6513518	0.2103887-1.2562852-0.1758175	0.4666739	0.2402562	0.5053520	0.7853981	1.9849596	
	1.3281422	0.1705482	0.5684755	2.1225204	2.2827590 1.2099829 1.0677309						
353	0.7183775	0.7183772	0.9492171	0.6514690	0.2107684-1.2573667-0.1765409	0.4674344	0.2406210	0.5053198	0.7853981	1.9812078	
	1.3267794	0.1709352	0.5680396	2.1225395	2.2826595 1.2090950 1.0665855						
354	0.7175642	0.7175638	0.9487553	0.6495464	0.2097482-1.2584285-0.1772517	0.4681767	0.2409850	0.5052873	0.7853981	1.9775572	
	1.3254128	0.1713234	0.5676005	2.1225567	2.2830658 1.2082109 1.0654364						
355	0.7167560	0.7167557	0.9482910	0.6496276	0.2094280-1.2595355-0.1779855	0.4685535	0.2413512	0.5052547	0.7853981	1.9737482	
	1.3240566	0.1717110	0.5671628	2.1225748	2.2834606 1.2073221 1.0642948						
356	0.7159441	0.7159438	0.9478261	0.6477012	0.2091078-1.2606316-0.1787052	0.4697094	0.2417153	0.5052226	0.7853981	1.9700527	
	1.3226915	0.1720989	0.5667248	2.1225920	2.2834631 1.2064352 1.0631475						
357	0.7151315	0.7151311	0.9473595	0.6467787	0.2087875-1.2616713-0.1794203	0.4704588	0.2420787	0.5051901	0.7853981	1.9664011	
	1.3213253	0.1724865	0.5662869	2.1226101	2.2842665 1.2055464 1.0619993						
358	0.7143208	0.7143204	0.9468918	0.6459560	0.2084673-1.2627518-0.1801424	0.4712191	0.2424350	0.5051580	0.7853981	1.9627766	
	1.3199625	0.1728739	0.5658490	2.1226282	2.2846661 1.2046566 1.0608540						
359	0.7135051	0.7135088	0.9464245	0.6449335	0.2081470-1.2638318-0.1808640	0.4719788	0.2428006	0.5051259	0.7853981	1.9590254	
	1.3185987	0.1732621	0.5654102	2.1226463	2.2850666 1.2037668 1.0597076						
360	0.7126966	0.7126963	0.9459548	0.6440114	0.2078269-1.2649053-0.1815811	0.4727322	0.2431605	0.5050935	0.7853981	1.9553862	
	1.3172321	0.1736494	0.5649723	2.1226645	2.2854681 1.2028761 1.0585594						
361	0.7118928	0.7118825	0.9454854	0.6431806	0.2075066-1.2659699-0.1822921	0.4734765	0.2435216	0.5050616	0.7853981	1.9518013	
	1.3158627	0.1740372	0.5645329	2.1226835	2.2858744 1.2019863 1.0574107						
362	0.7110716	0.7110713	0.9450147	0.6421661	0.2071864-1.2670446-0.1830094	0.4742319	0.2438797	0.5050296	0.7853981	1.9481773	
	1.3144970	0.1744265	0.5640935	2.1227026	2.2862768 1.2010956 1.0562639						
363	0.7102598	0.7102595	0.9445422	0.6412436	0.2068661-1.2681260-0.1837314	0.4749922	0.2442364	0.5049974	0.7853981	1.9445333	
	1.3131312	0.1748143	0.5636547	2.1227217	2.2866764 1.2002129 1.0551176						
364	0.7094488	0.7094483	0.9440710	0.6403212	0.2065455-1.2691998-0.1844579	0.4757458	0.2445940	0.5049653	0.7853981	1.9409351	
	1.3117657	0.1752034	0.5632144	2.1227407	2.2870789 1.1993122 1.0539713						
365	0.7086334	0.7086331	0.9435970	0.6393985	0.2062257-1.2702649-0.1851583	0.4764906	0.2449516	0.5049332	0.7853981	1.9373894	
	1.3103932	0.1755911	0.5627746	2.1227598	2.2874851 1.1984186 1.0528202						
366	0.7078195	0.7078195	0.9431236	0.6384760	0.2059055-1.2713291-0.1858680	0.4772346	0.2453088	0.5049012	0.7853981	1.9338579	
	1.3090215	0.1759813	0.5623338	2.1227789	2.2878914 1.1975269 1.0516701						
367	0.7070071	0.7070068	0.9426492	0.6375534	0.2055852-1.2724016-0.1865831	0.4779869	0.2456644	0.5048695	0.7853981	1.9302979	
	1.3076534	0.1763704	0.5618931	2.1227980	2.2882948 1.1966333 1.0505228						
368	0.7061945	0.7061942	0.9421738	0.6366311	0.2052651-1.2734736-0.1872956	0.4787356	0.2460188	0.5048373	0.7853981	1.9267635	
	1.3062846	0.1767600	0.5614520	2.1228199	2.2886992 1.1957397 1.0493746						
369	0.7053798	0.7053795	0.9416968	0.6357086	0.2049448-1.2745332-0.1880036	0.4794779	0.2463732	0.5048056	0.7853981	1.9232712	
	1.3049097	0.1771492	0.5610110	2.1228390	2.2891064 1.1948452 1.0482235						
370	0.7045653	0.7045650	0.9412189	0.6347861	1.2046246-1.2756307-0.1887147	0.4802253	0.2467266	0.5047739	0.7853981	1.9197636	
	1.3035374	0.1775382	0.5605701	2.1228580	2.2895107 1.1939487 1.0470734						
371	0.7037512	0.7037510	0.9407392	0.6338637	0.2043343-0.2766675-0.1894251	0.4809719	0.2470778	0.5047418	0.7853981	1.9162712	
	1.3021650	0.1779271	0.5601290	2.1228790	2.2899161 1.1930523 1.0459232						
372	0.7029385	0.7029386	0.9402600	0.6329414	0.2039941-0.2777432-0.1901414	0.4817274	0.2474286	0.5047101	0.7853981	1.9127464	
	1.3007956	0.1783170	1.5596870	2.1228991	2.2903185 1.1921560 1.0447760						
373	0.7021235	0.7021236	0.9397751	0.6320189	0.2036639-0.2788036-0.1908472	0.4824675	0.2477795	0.5046784	0.7853981	1.9093037	
	1.2994194	0.1787068	0.5592449	2.1229191	2.2907267 1.1912603 1.0436239						
374	0.7013096	0.7013093	0.9392987	0.6310962	0.2033437-0.2798657-0.1915538	0.4832094	0.2481304	0.5046467	0.7853981	1.9058619	
	1.2980442	0.1790972	0.5588021	2.1229401	2.2911339 1.1903629 1.0424738						
375	0.7004946	0.7004945	0.9389177	0.6301737	0.2030234-0.2809247-0.1922583	0.4839482	0.2484810	0.5046150	0.7853981	1.9024448	
	1.2966950	0.1794881	0.5583588	2.1229610	2.2915430 1.1894665 1.0413227						
376	0.6996778	0.6996775	0.9383342	0.6292513	0.2027032-0.2819769-0.1929579	0.4846802	0.2488307	0.5045833	0.7853981	1.8990679	
	1.2952858	0.1798780	0.5579161	2.1229820	2.2919531 1.1885681 1.0401688						
377	0.6988631	0.6988628	0.9378502	0.6283286	0.2023830-0.2830436-0.1936671	0.4854265	0.2491785	0.5045516	0.7853981	1.8956337	
	1.2939148	0.1802693	0.5574729	2.1230030	2.2923594 1.1876688 1.0390186						
378	0.6980482	0.6980480	0.9373655	0.6274064	0.2020628-0.2841064-0.1943735	0.4861692	0.2495248	0.5045203	0.7853981	1.8922272	
	1.2925388	0.1806589	0.5570295	2.1230245	2.2927666 1.1867695 1.0378685						
379	0.6972315	0.6972316	0.9368790	0.6264840	0.2017425-0.2851673-0.1950716	0.4869558	0.2498719	0.5044886	0.7853981	1.8888055	
	1.2911577	0.1810491	0.5565861	2.1230455	2.2931776 1.1858692 1.0367136						
380	0.6964178	0.6964173	0.9363978	0.6255616	0.2014223-0.2862215-0.1957785	0.4876438	0.2502178	0.5044574	0.7853981	1.8854523	
	1.2897816	0.1814405	0.5561416	2.1230679	2.2935848 1.1849699 1.0355635						
381	0.6956015	0.6956016	0.9359055	0.6246386	1.2011321-0.2872801-0.1964815	0.4883822	0.2505627	0.5044257	0.7853981	1.8821335	
	1.2884026	0.1818316	0.5556973	2.1230898	2.2939939 1.1840687 1.0344114						
382	0.6947846	0.6947843	0.9354100	0.6237165	0.2117819-0.2883257-0.1971754	0.4891075	0.2509084	0.5043944	0.7853981	1.8788433	
	1.2870197	0.1822229	0.5552524	2.1231117	2.2944069 1.1831675 1.0332565						
383	0.6939677	0.6939674	0.9349272	0.6227939	0.2014616-0.2893831-0.1978773	0.4898447	0.2512511	0.5043627	0.7853981	1.8755083	
	1.2856388	0.1826135	0.5548083	2.1231337	2.2948169 1.1822643 1.0321026						
384	0.6931518	0.6931513	0.9344375	0.6218713	0.2011414-0.2904395-0.1985782	0.4905809	0.2515947	0.5043314	0.7853981	1.8721667	
	1.2842575	0.1830053	0.5543627	2.1231565	2.2952261 1.1813622 1.0309565						
385	0.6923334	0.6923331	0.5539473	0.6209484	0.1998212-0.2914867-0.1992728	0.4913079	0.2519386	0.5043001	0.7853981	1.8689165	
	1.2828741	0.1833976	0.5539165	2.1231785	2.2956401 1.1804600 1.0297947						
386	0.6915168	0.6915165	0.9334557	0.6200256	.1995009-0.2925363-0.1999688	0.4920372	0.2522804	0.5042688	0.7853981	1.8656435	
	1.2814903	0.1837894	0.5534707	2.1232023	2.2960520 1.1795559 1.0286407						
387	0.6906998	0.6906996	0.9329637	0.6191033	0.1991807-0.2935909-0.2006673	0.4927716	0.2526218	0.5042376	0.7853981	1.8623581	
	1.2801075	0.1841816	0.5530244	2.1232243	2.2964633 1.1786528 1.0274968						

388	0.6898836	0.6898827	0.9324705	0.6181803	0.1988605	-0.2946449	-0.2013663	0.4935054	0.2529622	0.5042062	0.7853981	1.8590841
	1.2787247	0.1845743	0.5525774	2.1232471	2.2968750	1.1777487	1.0263329					
389	0.6890662	0.6890659	0.9319755	0.6172580	0.1985403	-0.2956954	-0.2020623	0.4942357	0.2533007	0.5041749	0.7853981	1.8558340
	1.2773405	0.1845664	0.5521311	2.1232709	2.2972879	1.1768436	1.0251789					
390	0.6882466	0.6882465	0.9314814	0.6163349	0.1982209	-0.2967398	-0.2027540	0.4949598	0.2536420	0.5041441	0.7853981	1.8526201
	1.2759514	0.1853558	0.5516830	2.1232548	2.2977028	1.1759386	1.0240221					
391	0.6874251	0.6874254	0.9309849	0.6154126	0.1978993	-0.2977889	-0.2034486	0.4956887	0.2539754	0.5041128	0.7853981	1.8493938
	1.2745676	0.1857520	0.5512363	2.1233117	2.2981148	1.1750326	1.0228672					
392	0.6866111	0.6866108	0.9304863	0.6144991	0.1975796	-0.2988346	-0.2041407	0.4964142	0.2543157	0.5040818	0.7853981	1.8461914
	1.2731751	0.1861439	0.5507895	2.1233416	2.2985287	1.1741247	1.0217113					
393	0.6857924	0.6857921	0.9299872	0.6135674	0.1972594	-0.2998831	-0.2048346	0.4971425	0.2546517	0.5040507	0.7853981	1.8429852
	1.2717515	0.1865369	0.5503415	2.1233654	2.2989436	1.1732178	1.0205545					
394	0.6849737	0.6849734	0.9294882	0.6126447	0.1969391	-0.3009308	-0.2055277	0.4978699	0.2549877	0.5040193	0.7853981	1.8397513
	1.2704048	0.1869300	0.5498933	2.1233862	2.2993565	1.1723099	1.0193787					
395	0.6841541	0.6841538	0.9289888	0.6117218	0.1965189	-0.3019657	-0.2062119	0.4985846	0.2553241	0.5039885	0.7853981	1.8366613
	1.2690134	0.1873237	0.5494443	2.1234140	2.2997742	1.1714020	1.0182400					
396	0.6833344	0.6833341	0.9284885	0.6107990	0.1962987	-0.3030066	-0.2069301	0.4993052	0.2556596	0.5039576	0.7853981	1.8335142
	1.2676210	0.1877175	0.5489952	2.1234379	2.3001909	1.1704931	1.0170822					
397	0.6825175	0.6825172	0.9279868	0.6098763	0.1959785	-0.3040578	-0.2075949	0.5000362	0.2559919	0.5039267	0.7853981	1.8303259
	1.2662354	0.1881112	0.5485461	2.1234627	2.3006039	1.1695843	1.0159283					
398	0.6816967	0.6816964	0.9274840	0.6089533	0.1956582	-0.3051033	-0.2082837	0.5007585	0.2563258	0.5038958	0.7853981	1.8271514
	1.2648420	0.1885051	0.5480965	2.1234875	2.3011206	1.1686735	1.0147696					
399	0.6808774	0.6808771	0.9269810	0.6080304	0.1953393	-0.3061391	-0.2089699	0.5014771	0.2566584	0.5038649	0.7853981	1.8240786
	1.2634506	0.1888994	0.5476464	2.1235123	2.3014383	1.1677637	1.0136118					
400	0.6800562	0.6800560	0.9264773	0.6071075	0.1951178	-0.3071772	-0.2096554	0.5021950	0.2569917	0.5038341	0.7853981	1.8209753
	1.2620564	0.1892939	0.5471955	2.1235371	2.3018560	1.1668530	1.0124521					
401	0.6792362	0.6792359	0.9259713	0.6061845	0.1946976	-0.3082116	-0.2103381	0.5029091	0.2573225	0.5038032	0.7853981	1.8178578
	1.2606630	0.1896882	0.5467455	2.1235619	2.3022747	1.1659412	1.0112934					
402	0.6784156	0.6784153	0.9254649	0.6052617	0.1943773	-0.3092575	-0.2110285	0.5036348	0.2576525	0.5037723	0.7853981	1.8147774
	1.2592697	0.1900825	0.5462950	2.1235876	2.3026905	1.1650286	1.0101347					
403	0.6775964	0.6775961	0.9249571	0.6043388	0.1940571	-0.3102965	-0.2117139	0.5043536	0.2579804	0.5037418	0.7853981	1.8116551
	1.2578764	0.1904770	0.5458443	2.1236134	2.3031073	1.1641150	1.0089779					
404	0.6767745	0.6767742	0.9244530	0.6034156	0.1937369	-0.3113239	-0.2123914	0.5050607	0.2583110	0.5037110	0.7853981	1.8086720
	1.2564783	0.1908724	0.5453922	2.1236391	2.3035297	1.1632032	1.0078163					
405	0.6759525	0.6759526	0.9239415	0.6024926	0.1934167	-0.3123621	-0.2130761	0.5057787	0.2586400	0.5036802	0.7853981	1.8056087
	1.2550821	0.1912677	0.5449403	2.1236649	2.3039404	1.1622896	1.0066557					
406	0.6751320	0.6751317	0.9234312	0.6015695	0.1930964	-0.3133992	-0.2137595	0.5064956	0.2589668	0.5036496	0.7853981	1.8025589
	1.2536865	0.1916629	0.5444883	2.1236906	2.3043671	1.1613750	1.0054970					
407	0.6743109	0.6743105	0.9229211	0.6006466	0.1927762	-0.3144392	-0.2144389	0.5072064	0.2592947	0.5036188	0.7853981	1.7995424
	1.2522875	0.1920584	0.5440357	2.1237173	2.3047886	1.1604605	1.0043354					
408	0.6734888	0.6734877	0.9224091	0.5997231	0.1924559	-0.3154636	-0.2151196	0.5079195	0.2596207	0.5035883	0.7853981	1.7965231
	1.2508898	0.1924543	0.5435928	2.1237440	2.3052102	1.1595449	1.0031748					
409	0.6726677	0.6726674	0.9218982	0.5987997	0.1921358	-0.3165151	-0.2158056	0.5086408	0.2599466	0.5035578	0.7853981	1.7934780
	1.2494936	0.1928511	0.5431288	2.1237717	2.3056278	1.1586294	1.0020161					
410	0.6718443	0.6718440	0.9213850	0.5978763	0.1918155	-0.3175316	-0.2164813	0.5093471	0.2602724	0.5035274	0.7853981	1.7905045
	1.2480977	0.1932474	0.5426751	2.1237974	2.3060503	1.1577129	1.0008526					
411	0.6710210	0.6710207	0.9208720	0.5969530	0.1914953	-0.3185544	-0.2171544	0.5100497	0.2605984	0.5034969	0.7853981	1.7875528
	1.2466988	0.1936444	0.5422206	2.1238251	2.3064756	1.1567974	0.9996902					
412	0.6701977	0.6701967	0.9203566	0.5960298	0.1911750	-0.3195882	-0.2178346	0.5107633	0.2609204	0.5034664	0.7853981	1.7845621
	1.2452980	0.1940408	0.5417666	2.1238518	2.3068962	1.1558800	0.9985304					
413	0.6693755	0.6693752	0.9199409	0.5951062	0.1908548	-0.3206129	-0.2185085	0.5114677	0.2612447	0.5034359	0.7853981	1.7816191
	1.2438960	0.1944378	0.5413116	2.1238794	2.3073206	1.1549616	0.9973669					
414	0.6685528	0.6685525	0.9193245	0.5941825	0.1905346	-0.3216425	-0.2191854	0.5121771	0.2615669	0.5034055	0.7853981	1.7786617
	1.2424855	0.1948349	0.5408565	2.1239071	2.3077431	1.1540432	0.9962041					
415	0.6677291	0.6677288	0.9189077	0.5932591	0.1902144	-0.3226718	-0.2198621	0.5128862	0.2618895	0.5033751	0.7853981	1.7757130
	1.2410812	0.1952328	0.5404004	2.1239357	2.3081675	1.1531248	0.9950406					
416	0.6669045	0.6669046	0.9182899	0.5923356	0.1898941	-0.3236914	-0.2205319	0.5135856	0.2622107	0.5033450	0.7853981	1.7728109
	1.2396759	0.1956301	0.5399448	2.1239634	2.3085928	1.1522045	0.9938763					
417	0.6660808	0.6660805	0.9177693	0.5914122	0.1895739	-0.3247167	-0.2212055	0.5142906	0.2625304	0.5033145	0.7853981	1.7698936
	1.2382708	0.1960275	0.5394890	2.1239910	2.3090172	1.1512842	0.9927125					
418	0.6652565	0.6652566	0.9172481	0.5904886	0.1892537	-0.3257410	-0.2218791	0.5149947	0.2628500	0.5032844	0.7853981	1.7669878
	1.2368650	0.1964254	0.5390325	2.1240187	2.3094425	1.1503639	0.9915487					
419	0.6644324	0.6644321	0.9167266	0.5895652	0.1889335	-0.3267648	-0.2225533	0.5156983	0.2631680	0.5032540	0.7853981	1.7640515
	1.2354584	0.1968229	0.5385762	2.1240462	2.3098659	1.1494417	0.9903842					
420	0.6636082	0.6636080	0.9162052	0.5886411	0.1886132	-0.3277885	-0.2232223	0.5164018	0.2634867	0.5032239	0.7853981	1.7612028
	1.2340521	0.1972210	0.5381184	2.1240738	2.3102912	1.1485195	0.9892201					
421	0.6627831	0.6627828	0.9156824	0.5877174	0.1882930	-0.3288152	-0.2238852	0.5170982	0.2638046	0.5031939	0.7853981	1.7583485
	1.2326431	0.1976204	0.5376607	2.1241014	2.3107214	1.1475983	0.9880546					
422	0.6619582	0.6619580	0.9151579	0.5867936	0.1879728	-0.3298402	-0.2245615	0.5178030	0.2641206	0.5031638	0.7853981	1.7554684
	1.2312346	0.1980184	0.5372030	2.1241290	2.3111467	1.1466742	0.9868897					
423	0.6611335	0.6611336	0.9146330	0.5858698	0.1876526	-0.3308573	-0.2252353	0.5185099	0.2644359	0.5031337	0.7853981	1.7525873
	1.2298275	0.1984178	0.5367447	2.1241566	2.3115721	1.1457510	0.9857251					

424	0.6603072	0.66030770	0.9141073	0.5849460	0.1873323	-0.3318694	-0.2258983	0.5192018	0.2647520	0.5031036	0.7853581	1.7497730
	1.2284158	0.19680168	0.5362861	2.1241941	2.3120022	1.1448269	0.9845577					
425	0.6594816	0.65948813	0.9135804	0.5840220	0.1879121	-0.3328897	-0.2265669	0.5199018	0.2650664	0.5030737	0.7853981	1.7469330
	1.2277066	0.19952161	0.5358271	2.1242228	2.3124294	1.1439918	0.9833915					
426	0.6586550	0.65865547	0.9130535	0.5830578	0.1866919	-0.3339337	-0.2272311	0.5205956	0.2653816	0.5030435	0.7853981	1.7441263
	1.2755526	0.19566162	0.5353672	2.1242533	2.3128595	1.1427768	0.9822339					
427	0.6578295	0.65782956	0.9125250	0.5821737	0.1863717	-0.3349253	-0.2279003	0.5212970	0.2656940	0.5030134	0.7853581	1.7412939
	1.2241831	0.20001610	0.5349073	2.1242828	2.3132877	1.1420517	0.9810587					
428	0.6570026	0.65700223	0.9119960	0.5812496	0.1860514	-0.3359323	-0.2285591	0.5219837	0.2660075	0.5029834	0.7853981	1.7385283
	1.2227676	0.20071620	0.5344470	2.1243134	2.3137197	1.1411257	0.9798902					
429	0.6561761	0.65617590	0.9114659	0.5803251	0.1857312	-0.3369529	-0.2292271	0.5226842	0.2663195	0.5029538	0.7853981	1.7357140
	1.2213545	0.21080168	0.5339960	2.1243439	2.3141489	1.1401978	0.9787229					
430	0.6553491	0.65534880	0.9109364	0.5794008	0.1854110	-0.3379644	-0.2298888	0.5233754	0.2666324	0.5029237	0.7853981	1.7329445
	1.2199402	0.20121810	0.5335243	2.1243744	2.3145809	1.1392727	0.9775547					
431	0.6545210	0.65452077	0.9104136	0.5784764	0.1850908	-0.3389723	-0.2305478	0.5240631	0.2669431	0.5028940	0.7853581	1.7301550
	1.2185240	0.20161870	0.5330630	2.1244049	2.3150129	1.1383438	0.9763851					
432	0.6536923	0.65365200	0.9098721	0.5775516	0.1847705	-0.3399825	-0.2312092	0.5247530	0.2672552	0.5028639	0.7853581	1.7274427
	1.2171056	0.20202050	0.5326002	2.1244364	2.3154469	1.1374159	0.9752147					
433	0.6528665	0.65286662	0.9093387	0.5766275	0.1844503	-0.3409978	-0.2318718	0.5254481	0.2675636	0.5028343	0.7853981	1.7246761
	1.2156925	0.20242117	0.5321380	2.1244678	2.3158771	1.1364870	0.9740484					
434	0.6520378	0.65203750	0.9088050	0.5757024	0.1841301	-0.3420104	-0.2325337	0.5261405	0.2678738	0.5028046	0.7853981	1.7219286
	1.2142744	0.20282742	0.5316744	2.1244984	2.3163099	1.1355581	0.9728780					
435	0.6512098	0.65120955	0.5082699	0.5747781	0.1838099	-0.3430185	-0.2331921	0.5268284	0.2681820	0.5027750	0.7853581	1.7192039
	1.2128553	0.20322250	0.5312115	2.1245308	2.3167430	1.1346283	0.9717084					
436	0.6503806	0.65038066	0.9077327	0.5738534	0.1834896	-0.3440236	-0.2338483	0.5275132	0.2684850	0.5027453	0.7853581	1.7164974
	1.2114353	0.20362276	0.5307482	2.1245623	2.3171787	1.1336966	0.9705377					
437	0.6495514	0.64955511	0.9071962	0.5729286	0.1831694	-0.3450304	-0.2345053	0.5281958	0.2687970	0.5027156	0.7853981	1.7137518
	1.2100142	0.20402302	0.5302839	2.1245947	2.3176136	1.1327658	0.9693661					
438	0.6487225	0.64872256	0.9066580	0.5720037	0.1828492	-0.3460373	-0.2351624	0.5288864	0.2691027	0.5026860	0.7853981	1.7110910
	1.2085953	0.20442329	0.5298194	2.1246271	2.3180485	1.1318341	0.9681961					
439	0.6478931	0.64789258	0.9061188	0.5710789	0.1825290	-0.3470437	-0.2358190	0.5295727	0.2694083	0.5026563	0.7853981	1.7083588
	1.2071724	0.20483355	0.5293548	2.1246595	2.3184834	1.1309013	0.9670240					
440	0.6470634	0.64706631	0.9055794	0.5701540	0.1822087	-0.3480487	-0.2364743	0.5302575	0.2697136	0.5026267	0.7853581	1.7057190
	1.2057514	0.20523388	0.5288893	2.1246920	2.3189192	1.1299686	0.9658523					
441	0.6462348	0.64623450	0.9050383	0.5692290	0.1818885	-0.3490567	-0.2371315	0.5309452	0.2700168	0.5025971	0.7853581	1.7030334
	1.2043304	0.20564421	0.5284238	2.1247244	2.3193541	1.1290359	0.9646818					
442	0.6454036	0.64540433	0.9044977	0.5683037	0.1815683	-0.3500524	-0.2377803	0.5316207	0.2703222	0.5025678	0.7853981	1.7004023
	1.2029093	0.20604463	0.5279570	2.1247578	2.3197947	1.1281023	0.9635078					
443	0.6445738	0.64457350	0.9039562	0.5673784	0.1812481	-0.3510587	-0.2384358	0.5323067	0.2706255	0.5025385	0.7853981	1.6977348
	1.2014818	0.20645506	0.5274900	2.1247902	2.3202305	1.1271697	0.9623361					
444	0.6437430	0.64374271	0.9034126	0.5664529	0.1809278	-0.3520618	-0.2390891	0.5329856	0.2709280	0.5025089	0.7853581	1.6950874
	1.2000561	0.20685549	0.5270228	2.1248236	2.3206682	1.1262331	0.9611626					
445	0.6429125	0.64291722	0.9028689	0.5655276	0.1806076	-0.3530614	-0.2397359	0.5336650	0.2712259	0.5024796	0.7853981	1.6924591
	1.1986303	0.20725555	0.5265552	2.1248575	2.3211069	1.1252975	0.9599897					
446	0.6420802	0.64207993	0.9023243	0.5646020	0.1802874	-0.3540577	-0.2403803	0.5343450	0.2715322	0.5024500	0.7853981	1.6898489
	1.1972017	0.20766646	0.5260868	2.1248922	2.3215485	1.1243620	0.9588141					
447	0.6412503	0.64125300	0.9017785	0.5636765	0.1799672	-0.3550612	-0.2410411	0.5350283	0.2718318	0.5024207	0.7853581	1.6872177
	1.1957765	0.20806697	0.5256184	2.1249256	2.3219862	1.1234255	0.9576421					
448	0.6404176	0.64041730	0.9012315	0.5627508	0.1796469	-0.3560596	-0.2416906	0.5357065	0.2721326	0.5023915	0.7853581	1.6846123
	1.1943474	0.20847751	0.5251493	2.1249599	2.3224268	1.1224880	0.9564662					
449	0.6395860	0.63958571	0.9006835	0.5618253	0.1793267	-0.3570535	-0.2423366	0.5363802	0.2724307	0.5023622	0.7853581	1.6820288
	1.1929178	0.20888803	0.5246805	2.1249943	2.3228674	1.1215496	0.9552915					
450	0.6387535	0.63875320	0.9001355	0.5608994	0.1790065	-0.3580474	-0.2429827	0.5370539	0.2727300	0.5023329	0.7853981	1.6794519
	1.1914873	0.20928855	0.5242104	2.1250296	2.3233099	1.1206121	0.9541159					
451	0.6379207	0.63792044	0.8995877	0.5599734	0.1786863	-0.3590403	-0.2436277	0.5377266	0.2730298	0.5023037	0.7853981	1.6768856
	1.1900566	0.20969341	0.5237393	2.1250659	2.3237534	1.1196737	0.9529399					
452	0.6370881	0.63706678	0.8990377	0.5590472	0.1783660	-0.3600416	-0.2442783	0.5384076	0.2733275	0.5022745	0.7853581	1.6742526
	1.1886262	0.21010303	0.5232682	2.1251022	2.3241993	1.1187344	0.9517638					
453	0.6362546	0.63625455	0.8984855	0.5581213	0.1780458	-0.3610309	-0.2449206	0.5390767	0.2736233	0.5022455	0.7853581	1.6717501
	1.1871920	0.21051265	0.5227975	2.1251385	2.3246384	1.1177940	0.9505869					
454	0.6354231	0.63542350	0.8979345	0.5571952	0.1777256	-0.3620231	-0.2455711	0.5397587	0.2739187	0.5022163	0.7853981	1.6691656
	1.1857634	0.21092140	0.5223255	2.1251757	2.3250793	1.1168537	0.9494134					
455	0.6345875	0.63458776	0.8973814	0.5562689	0.1774054	-0.3630139	-0.2462173	0.5404184	0.2742157	0.5021874	0.7853581	1.6666708
	1.1843352	0.21133212	0.5218534	2.1252140	2.3255227	1.1159124	0.9482327					
456	0.6337525	0.63376255	0.8968264	0.5553426	0.1770851	-0.3640032	-0.2468637	0.5410953	0.2745956	0.5021540	0.7853581	1.6663427
	1.1828996	0.21174183	0.5213813	2.1252470	2.3259692	1.1149702	0.9470541					
457	0.6329162	0.63291627	0.8962727	0.5544162	0.1767649	-0.3649912	-0.2475101	0.5417701	0.2748969	0.5021290	0.7853581	1.6616879
	1.1814485	0.21215264	0.5209077	2.1252815	2.3264227	1.1140280	0.9458719					
458	0.6319561	0.63195581	0.8957175	0.5534897	0.1764446	-0.3659793	-0.2481529	0.5424379	0.2751853	0.5020958	0.7853981	1.6613197
	1.1797962	0.21256348	0.5204340	2.1253165	2.3270626	1.1130857	0.9445159					
459	0.6311183	0.63111880	0.8951610	0.5525630	0.1761245	-0.3663679	-0.2488744	0.5424923	0.2754802	0.5020666	0.7853981	1.6588621
	1.1783543	0.21297431	0.5199599	2.1253567	2.3275137	1.1121426	0.9433327					

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460	0.6302841	0.6302838	0.8946051	0.5516262	0.1758042	-0.3673589	-0.2490166	0.5431631	0.2757735	0.5020378	0.7853981	1.6563482
	1.1769180	0.2133527	0.5194846	2.1253925	2.3279600	1.1111994	0.9421546					
461	0.6294484	0.6294481	0.8940479	0.5507093	0.1754840	-0.3683434	-0.2496542	0.5438274	0.2760662	0.5020099	0.7853981	1.6563649
	1.1754785	0.2137623	0.5190091	2.1254371	2.3284792	1.1112562	0.9409744					
462	0.6286115	0.6286116	0.8934892	0.5497820	0.1751637	-0.3693216	-0.2502874	0.5444854	0.2763584	0.5019800	0.7853981	1.6514091
	1.1740370	0.2141121	0.5185331	2.1254683	2.3288603	1.1093111	0.9397931					
463	0.6277763	0.6277760	0.8929314	0.5488550	0.1748435	-0.3703221	-0.2509219	0.5451457	0.2766598	0.5019512	0.7853581	1.6489515
	1.1725965	0.2145028	0.5180560	2.1255054	2.3293114	1.1083679	0.9386131					
464	0.6269401	0.6269398	0.8923702	0.5479279	0.1745233	-0.3712907	-0.2515616	0.5458140	0.2769404	0.5019223	0.7853581	1.6464691
	1.1711555	0.2149527	0.5175796	2.1255426	2.3297596	1.1074209	0.9374319					
465	0.6261034	0.6261031	0.8918085	0.5470009	0.1742031	-0.3722699	-0.2521948	0.5464730	0.2772297	0.5018939	0.7853981	1.6440258
	1.1697130	0.2154028	0.5171028	2.1255808	2.3302107	1.1064739	0.9362504					
466	0.6252658	0.6252655	0.8912453	0.5460736	0.1738828	-0.3732490	-0.2528279	0.5471318	0.2775182	0.5018651	0.7853581	1.6415882
	1.1682692	0.2158131	0.5166255	2.1256189	2.3306618	1.1055260	0.9350675					
467	0.6244285	0.6244282	0.8906829	0.5451460	0.1735626	-0.3742272	-0.2534602	0.5477899	0.2778075	0.5018362	0.7853581	1.6391602
	1.1668253	0.2162247	0.5161468	2.1256580	2.3311148	1.1045790	0.9338850					
468	0.6235906	0.6235903	0.8901187	0.5442185	0.1732424	-0.3752122	-0.2540901	0.5484446	0.2780955	0.5018077	0.7853581	1.6367483
	1.1653786	0.2166359	0.5156682	2.1256962	2.3315687	1.1036310	0.9327017					
469	0.6227533	0.6227530	0.8895538	0.5432909	0.1729222	-0.3761872	-0.2547264	0.5491054	0.2783823	0.5017788	0.7853981	1.6343050
	1.1639347	0.2170477	0.5151890	2.1257353	2.3320198	1.1026821	0.9315193					
470	0.6219141	0.6219138	0.8889885	0.5423630	0.1726019	-0.3771552	-0.2553513	0.5497571	0.2786700	0.5017505	0.7853981	1.6319304
	1.1624861	0.2174600	0.5147085	2.1257744	2.3324766	1.1017332	0.9303342					
471	0.6210773	0.6210770	0.8884215	0.5414352	0.1722817	-0.3781424	-0.2559885	0.5504241	0.2789546	0.5017219	0.7853581	1.6294899
	1.1610422	0.2178723	0.5142288	2.1258135	2.3329277	1.1007833	0.9291526					
472	0.6202381	0.6202378	0.8878544	0.5405072	0.1719615	-0.3791149	-0.2566161	0.5510764	0.2792407	0.5016931	0.7853581	1.6271086
	1.1595936	0.2182852	0.5137478	2.1258535	2.3333836	1.0998335	0.9279674					
473	0.6193994	0.6193991	0.8872851	0.5395793	0.1716413	-0.3810094	-0.2572446	0.5517307	0.2795244	0.5016646	0.7853981	1.6247234
	1.1581450	0.2186977	0.5132670	2.1258926	2.3338385	1.0988817	0.9267829					
474	0.6185608	0.6185605	0.8867149	0.5386513	0.1713210	-0.3810691	-0.2578763	0.5523902	0.2798071	0.5016362	0.7853581	1.6223259
	1.1566963	0.2191106	0.5127857	2.1259327	2.3342924	1.0979290	0.9255967					
475	0.6177186	0.6177185	0.8861443	0.5377231	0.1710008	-0.3820251	-0.2585222	0.5530259	0.2800919	0.5016077	0.7853981	1.6200199
	1.1552410	0.2195239	0.5123035	2.1259727	2.3347540	1.0969763	0.9244095					
476	0.6168810	0.6168807	0.8855714	0.5367949	0.1706816	-0.3830394	-0.2591267	0.5536909	0.2803715	0.5015793	0.7853581	1.6176147
	1.1537933	0.2199370	0.5118216	2.1260138	2.3352070	1.0960226	0.9232266					
477	0.6160395	0.6160392	0.8849996	0.5359663	0.1703604	-0.3839792	-0.2597515	0.5543356	0.2806549	0.5015509	0.7853981	1.6152687
	1.1523350	0.2203514	0.5113381	2.1260549	2.3356657	1.0950689	0.9220381					
478	0.6151982	0.6151979	0.8844271	0.5349379	0.1700401	-0.3849396	-0.2603697	0.5549797	0.2809373	0.5015228	0.7853581	1.6129559
	1.1508837	0.2207660	0.5108541	2.1260958	2.3361273	1.0941153	0.9208501					
479	0.6143559	0.6143556	0.8838521	0.5340093	0.1697199	-0.3858217	-0.2610021	0.5556417	0.2812159	0.5014943	0.7853581	1.6105785
	1.1494341	0.2211805	0.5103703	2.1261358	2.3365822	1.0931606	0.9196655					
480	0.6135124	0.6135121	0.8832772	0.5331814	0.1693997	-0.3868090	-0.2616243	0.5562887	0.2814960	0.5014659	0.7853581	1.6082554
	1.1479757	0.2215958	0.5098853	2.1261778	2.3370419	1.0922050	0.9184780					
481	0.6126773	0.6126770	0.8827016	0.5321516	0.1690795	-0.3878563	-0.2622466	0.5569358	0.2817754	0.5014378	0.7853981	1.6059380
	1.1465235	0.2220113	0.5093999	2.1262197	2.3375025	1.0912495	0.9172993					
482	0.6118345	0.6118346	0.8821257	0.5312224	0.1687592	-0.3888199	-0.2628661	0.5575791	0.2820556	0.5014094	0.7853581	1.6036377
	1.1450672	0.2224276	0.5089134	2.1262608	2.3379650	1.0902939	0.9161007					
483	0.6119538	0.6109533	0.8815477	0.5302936	0.1684390	-0.3897853	-0.2634865	0.5582244	0.2823329	0.5013813	0.7853581	1.6013355
	1.1436100	0.2228434	0.5084274	2.1263037	2.3384266	1.0893364	0.9149125					
484	0.6101516	0.6101513	0.8809689	0.5293643	0.1681188	-0.3907514	-0.2641076	0.5588702	0.2826102	0.5013533	0.7853581	1.5990353
	1.1421518	0.2232559	0.5079404	2.1263466	2.3388882	1.0883789	0.9137235					
485	0.6093075	0.6093072	0.8803885	0.5284350	0.1677986	-0.3917125	-0.2647246	0.5595111	0.2828872	0.5013248	0.7853981	1.5967588
	1.1406918	0.2236761	0.5074533	2.1263885	2.3393517	1.0874195	0.9125314					
486	0.6084647	0.6084644	0.8798081	0.5275057	0.1674783	-0.3926685	-0.2653385	0.5601469	0.2831634	0.5012972	0.7853581	1.5945044
	1.1392298	0.2240931	0.5069653	2.1264324	2.3398181	1.0864611	0.9113415					
487	0.6076217	0.6076214	0.8792257	0.5265753	0.1671581	-0.3936204	-0.2659625	0.5607985	0.2834377	0.5012687	0.7853581	1.5921974
	1.1377716	0.2245101	0.5064773	2.1264744	2.3402786	1.0855007	0.9101509					
488	0.6067756	0.6067787	0.8786429	0.5256465	0.1668379	-0.3946091	-0.2665781	0.5614380	0.2837118	0.5012410	0.7853581	1.5899391
	1.1363106	0.2249277	0.5059883	2.1265182	2.3407431	1.0845404	0.9089611					
489	0.6059341	0.6059338	0.8780596	0.5247167	0.1665177	-0.3955627	-0.2671957	0.5620804	0.2839867	0.5012127	0.7853981	1.5876751
	1.1348476	0.2253457	0.5054986	2.1265612	2.3412085	1.0835791	0.9077678					
490	0.6050905	0.6050902	0.8774764	0.5237869	0.1661974	-0.3965212	-0.2678101	0.5627196	0.2842609	0.5011849	0.7853981	1.5854311
	1.1333841	0.2257645	0.5050081	2.1266050	2.3416743	1.0826187	0.9065766					
491	0.6042466	0.6042463	0.8768931	0.5228571	0.1658772	-0.3974824	-0.2684263	0.5633556	0.2845324	0.5011569	0.7853581	1.5831804
	1.1319218	0.2261827	0.5045179	2.1266499	2.3421402	1.0816565	0.9053853					
492	0.6034011	0.6034008	0.8763098	0.5219274	0.1655571	-0.3984430	-0.2690428	0.5639940	0.2848049	0.5011289	0.7853581	1.5809584
	1.1304560	0.2266018	0.5040266	2.1266937	2.3426085	1.0806932	0.9041937					
493	0.6025556	0.6025555	0.8757272	0.5209962	0.1652368	-0.3993944	-0.2696511	0.5646312	0.2850772	0.5011012	0.7853581	1.5787315
	1.1289953	0.2270216	0.5035343	2.1267395	2.3430777	1.0797230	0.9029973					
494	0.6017122	0.6017119	0.8751303	0.5200650	0.1649165	-0.4003539	-0.2702655	0.5652703	0.2853481	0.5010731	0.7853981	1.5765009
	1.1275293	0.2274419	0.5030415	2.1267834	2.3435465	1.0787478	0.9018161					
495	0.6008654	0.6008651	0.8745408	0.5191334	0.1645963	-0.4013167	-0.2708751	0.5659033	0.2856164	0.5010454	0.7853581	1.5742979
	1.1260567	0.2278615	0.5025499	2.1268292	2.3440151	1.0777727	0.9006134					

496	0.6000195	0.6000196	0.8739510	0.5182046	0.1642761-0.4022617-0.2714862	0.5665378	0.2858878	0.5010178	0.7853981	1.5720921
	1.1245880	0.2282622	0.5020551	2.1268740	2.3444953 1.0768375 0.8994166					
497	0.5991737	0.5991734	0.8733615	0.5172739	0.1639559-0.4032165-0.2720969	0.5671723	0.2861581	0.5009897	0.7853981	1.5698919
	1.1231213	0.2287035	0.5015605	2.1269188	2.3449554 1.0758734 0.8982214					
498	0.5983272	0.5983269	0.8727702	0.5163428	0.1635356-0.4041681-0.2727054	0.5678037	0.2864268	0.5009621	0.7853981	1.5677061
	1.1216507	0.2291250	0.5010655	2.1269646	2.3454275 1.0749973 0.8970262					
499	0.5974802	0.5974799	0.8721776	0.5154119	0.1633154-0.4051244-0.2733167	0.5684398	0.2866545	0.5009345	0.7853981	1.5655088
	1.1201801	0.2295464	0.5005702	2.1270133	2.3459986 1.0739603 0.8958303					
500	0.5966324	0.5966321	0.8715847	0.5144805	0.1629952-0.4060714-0.2739215	0.5690666	0.2869627	0.5009068	0.7853981	1.5633488
	1.1187077	0.2299667	0.5000739	2.1270571	2.3463726 1.0729153 0.8946332					
501	0.5957854	0.5957851	0.8709905	0.5135494	0.1626750-0.4070268-0.2745319	0.5697017	0.2872289	0.5008792	0.7853981	1.5611629
	1.1172361	0.2303909	0.4995775	2.1271038	2.3468447 1.0718753 0.8934372					
502	0.5949375	0.5949376	0.8703956	0.5126179	0.1623547-0.4079730-0.2751359	0.5703277	0.2874951	0.5008518	0.7853981	1.5590134
	1.1157618	0.2308138	0.4990802	2.1271515	2.3473196 1.0710373 0.8922403					
503	0.5940906	0.5941903	0.8697994	0.5116863	0.1620345-0.4089242-0.2757431	0.5709587	0.2877559	0.5008242	0.7853981	1.5568514
	1.1142093	0.2312371	0.4985824	2.1271992	2.3477936 1.0700684 0.8910439					
504	0.5932421	0.5932418	0.8692033	0.5107545	0.1617143-0.4098747-0.2763495	0.5715850	0.2880255	0.5007966	0.7853981	1.5546951
	1.1128145	0.2316609	0.4980836	2.1272449	2.3482685 1.0690994 0.8898458					
505	0.5923932	0.5923929	0.8686042	0.5098229	0.1613941-0.4108245-0.2769553	0.5722186	0.2882885	0.5007693	0.7853981	1.5525465
	1.1113386	0.2320840	0.4975853	2.1272926	2.3487434 1.0681276 0.8886473					
506	0.5915438	0.5915435	0.8680052	0.5088907	0.1610738-0.4117710-0.2775586	0.5728448	0.2885522	0.5007415	0.7853981	1.5504122
	1.1098614	0.2325084	0.4970856	2.1273403	2.3492203 1.0671558 0.8874478					
507	0.5906944	0.5906941	0.8674055	0.5079586	0.1607536-0.4127112-0.2781577	0.5734648	0.2888151	0.5007143	0.7853981	1.5483046
	1.1083832	0.2329329	0.4965954	2.1273880	2.3496900 1.0661850 0.8862485					
508	0.5898446	0.5898445	0.8668051	0.5070263	0.1604334-0.4136566-0.2787559	0.5740899	0.2890776	0.5006866	0.7853981	1.5461826
	1.1069056	0.2333581	0.4960845	2.1274376	2.3501768 1.0652132 0.8850489					
509	0.5889942	0.5889939	0.8662040	0.5060939	0.1601132-0.4145960-0.2793581	0.5747092	0.2893399	0.5006594	0.7853981	1.5440845
	1.1054245	0.2337837	0.4955828	2.1274862	2.3506575 1.0642405 0.8838478					
510	0.5881436	0.5881435	0.8656009	0.5051613	0.1597929-0.4155430-0.2799610	0.5753359	0.2896005	0.5006321	0.7853981	1.5419655
	1.1039448	0.2342092	0.4950809	2.1275349	2.3511362 1.0632668 0.8826479					
511	0.5872944	0.5872941	0.8649985	0.5042283	0.1594727-0.4164929-0.2805651	0.5759647	0.2898614	0.5006049	0.7853981	1.5398445
	1.1024666	0.2346363	0.4945773	2.1275845	2.3516150 1.0622940 0.8814479					
512	0.5864432	0.5864429	0.8643950	0.5032955	0.1591524-0.4174295-0.2811613	0.5765820	0.2901217	0.5005776	0.7853981	1.5377645
	1.1009886	0.2350631	0.4940735	2.1276331	2.3520975 1.0613203 0.8802458					
513	0.5855926	0.5855923	0.8637898	0.5023624	0.1588322-0.4183748-0.2817625	0.5772070	0.2903805	0.5005503	0.7853981	1.5356636
	1.0995106	0.2354901	0.4935698	2.1276836	2.3525772 1.0603447 0.8790459					
514	0.5847395	0.5847396	0.8631852	0.5014291	0.1585120-0.4193090-0.2823564	0.5778210	0.2906413	0.5005230	0.7853981	1.5336046
	1.0980167	0.2359183	0.4930643	2.1277332	2.3530626 1.0593700 0.8778407					
515	0.5838879	0.5838876	0.8625788	0.5004958	0.1581917-0.4202476-0.2829520	0.5784393	0.2908999	0.5004958	0.7853981	1.5315342
	1.0965328	0.2363464	0.4925587	2.1277838	2.3535461 1.0583944 0.8766380					
516	0.5830365	0.5830362	0.8619715	0.4995625	0.1578715-0.4211907-0.2835519	0.5790622	0.2911572	0.5004686	0.7853981	1.5294514
	1.0950485	0.2367749	0.4920526	2.1278343	2.3540287 1.0574179 0.8754357					
517	0.5821846	0.5821843	0.8613632	0.4986286	0.1575513-0.4221306-0.2841487	0.5796819	0.2914141	0.5004417	0.7853981	1.5273848
	1.0935631	0.2372040	0.4915455	2.1278858	2.3545132 1.0564404 0.8742329					
518	0.5813306	0.5813303	0.8607527	0.4976951	0.1572311-0.4230617-0.2847396	0.5802928	0.2916702	0.5004144	0.7853981	1.5253496
	1.0920744	0.2376324	0.4910388	2.1279364	2.3549995 1.0554619 0.8730270					
519	0.5804785	0.5804782	0.8601426	0.4967612	0.1569108-0.4240009-0.2853357	0.5809118	0.2919254	0.5003872	0.7853981	1.5232925
	1.0905886	0.2380623	0.4905306	2.1279879	2.3554850 1.0544844 0.8718239					
520	0.5796254	0.5796251	0.8595300	0.4958273	0.1565906-0.4249418-0.2859325	0.5815325	0.2921791	0.5003603	0.7853981	1.5212336
	1.0891108	0.2384915	0.4900225	2.1280394	2.3559694 1.0535140 0.8706195					
521	0.5787705	0.5787706	0.8589173	0.4948929	0.1562704-0.4258741-0.2865236	0.5821445	0.2924336	0.5003334	0.7853981	1.5192070
	1.0876102	0.2389218	0.4895133	2.1280909	2.3564577 1.0525236 0.8694133					
522	0.5779161	0.5779158	0.8583050	0.4939585	0.1559502-0.4268031-0.2871123	0.5827532	0.2926888	0.5003065	0.7853981	1.5171957
	1.0861187	0.2393531	0.4890028	2.1281433	2.3569479 1.0515442 0.8682062					
523	0.5770619	0.5770616	0.8576912	0.4930240	0.1556299-0.4277340-0.2877029	0.5833640	0.2929421	0.5002797	0.7853981	1.5151806
	1.0846272	0.2397844	0.4884920	2.1281967	2.3574381 1.0505638 0.8670001					
524	0.5762074	0.5762071	0.8570764	0.4920892	0.1553097-0.4286697-0.2882946	0.5839794	0.2931947	0.5002527	0.7853981	1.5131540
	1.0831356	0.2402163	0.4879804	2.1282492	2.3579264 1.0495815 0.8657936					
525	0.5753516	0.5753513	0.8564618	0.4911539	0.1549895-0.4296027-0.2888854	0.5845922	0.2934486	0.5002255	0.7853981	1.5111408
	1.0816422	0.2406493	0.4874673	2.1283016	2.3584175 1.0486002 0.8645853					
526	0.5744953	0.5744950	0.8558460	0.4902189	0.1546693-0.4305261-0.2894695	0.5851954	0.2937017	0.5001987	0.7853981	1.5091619
	1.0801466	0.2410823	0.4869541	2.1283550	2.3589115 1.0476189 0.8633761					
527	0.5736401	0.5736398	0.8552292	0.4892837	0.1543493-0.4314554-0.2900577	0.5858045	0.2939528	0.5001721	0.7853981	1.5071669
	1.0786524	0.2415159	0.4864402	2.1284094	2.3594046 1.0466366 0.8621688					
528	0.5727841	0.5727838	0.8546110	0.4883484	0.1540288-0.4323857-0.2906459	0.5864145	0.2942035	0.5001453	0.7853981	1.5051727
	1.0771570	0.2419494	0.4859259	2.1284628	2.3598967 1.0456524 0.8609601					
529	0.5719286	0.5719283	0.8539906	0.4874133	0.1537096-0.4333193-0.2912362	0.5870278	0.2944514	0.5001184	0.7853981	1.5031719
	1.0756626	0.2423826	0.4854116	2.1285172	2.3603878 1.0446672 0.8597523					
530	0.5710714	0.5710712	0.8533684	0.4864777	0.1533904-0.4342430-0.2918197	0.5876313	0.2946991	0.5000919	0.7853981	1.5012064
	1.0741634	0.2428160	0.4848970	2.1285715	2.3608829 1.0436811 0.8585423					
531	0.5702131	0.5702129	0.8527464	0.4855419	0.1530681-0.4351670-0.2924034	0.5882351	0.2949477	0.5000651	0.7853981	1.4992437
	1.0726632	0.2432504	0.4843810	2.1286269	2.3613787 1.0426941 0.8573305					

532	0.5693557	0.5693555	0.8521254	0.4946057	0.1527479	-0.4360930	-0.2929882	0.5888409	0.2951968	0.5000386	0.7853981	1.4972782
	1.0711641	0.2436664	0.4838633	2.1286821	2.3618755	1.0417189	0.8561199					
533	0.5684996	0.5684554	0.8515029	0.4836656	0.1524277	-0.4370262	-0.2935774	0.5894539	0.2954435	0.5000117	0.7853981	1.4952527
	1.0696678	0.2441224	0.4833453	2.1287374	2.3623695	1.0407228	0.8549114					
534	0.5676402	0.5676359	0.8508779	0.4827334	0.1521075	-0.4379422	-0.2941551	0.5900497	0.2956903	0.4999852	0.7853981	1.4933672
	1.0681635	0.2445579	0.4829274	2.1287928	2.3628623	1.0397339	0.8536978					
535	0.5667811	0.5667815	0.8502533	0.4817966	0.1517872	-0.4388695	-0.2947401	0.5906567	0.2959367	0.4999588	0.7853981	1.4914983
	1.0666418	0.2449550	0.4823078	2.1288490	2.3633671	1.0387459	0.8524859					
536	0.5659221	0.5659219	0.8496280	0.4808601	0.1514679	-0.4397818	-0.2953151	0.5912488	0.2961831	0.4999322	0.7853981	1.4895000
	1.0651569	0.2454321	0.4817878	2.1289053	2.3638697	1.0377579	0.8512723					
537	0.5650634	0.5650632	0.8490002	0.4799232	0.1511468	-0.4407073	-0.2958896	0.5918541	0.2964268	0.4999058	0.7853981	1.4875536
	1.0636535	0.2458652	0.4812676	2.1289625	2.3643684	1.0367680	0.8500599					
538	0.5642044	0.5642042	0.8483727	0.4789864	0.1508266	-0.4416323	-0.2964813	0.5924588	0.2966710	0.4998792	0.7853981	1.4856129
	1.0621510	0.2463070	0.4807464	2.1290198	2.3648672	1.0357790	0.8488472					
539	0.5633425	0.5633422	0.8477437	0.4780492	0.1505063	-0.4425462	-0.2970568	0.5930525	0.2969157	0.4998528	0.7853981	1.4837103
	1.0606425	0.2467452	0.4802244	2.1290766	2.3653717	1.0347872	0.8476301					
540	0.5624846	0.5624837	0.8471144	0.4771122	0.1501861	-0.4434735	-0.2976403	0.5936586	0.2971578	0.4998263	0.7853981	1.4817715
	1.0591382	0.2471840	0.4797018	2.1291332	2.3658714	1.0337963	0.8464182					
541	0.5616226	0.5616224	0.8464822	0.4761747	0.1498659	-0.4443971	-0.2982153	0.5942530	0.2973992	0.4997998	0.7853981	1.4798746
	1.0576256	0.2476226	0.4791790	2.1291914	2.3663750	1.0328136	0.8452022					
542	0.5607613	0.5607611	0.8458499	0.4752373	0.1495457	-0.4453043	-0.2987923	0.5948500	0.2976404	0.4997737	0.7853981	1.4779711
	1.0561205	0.2480617	0.4786553	2.1292496	2.3668785	1.0318098	0.8439862					
543	0.5598996	0.5598554	0.8452182	0.4742591	0.1492254	-0.4462214	-0.2993690	0.5954468	0.2978826	0.4997472	0.7853981	1.4760723
	1.0546112	0.2485026	0.4781297	2.1293077	2.3673840	1.0308170	0.8427697					
544	0.5590391	0.5590394	0.8445840	0.4733615	0.1489052	-0.4471424	-0.2999460	0.5960476	0.2981212	0.4997212	0.7853981	1.4741640
	1.0531025	0.2489426	0.4776047	2.1293669	2.3678875	1.0298223	0.8415557					
545	0.5581753	0.5581750	0.8439496	0.4724231	0.1485853	-0.4480497	-0.3005179	0.5966347	0.2983626	0.4996946	0.7853981	1.4723034
	1.0515881	0.2493837	0.4770782	2.1294250	2.3683968	1.0288277	0.8403353					
546	0.5573135	0.5573137	0.8433145	0.4714845	0.1482648	-0.4489676	-0.3010845	0.5972323	0.2986014	0.4996686	0.7853981	1.4704113
	1.0500784	0.2498252	0.4765511	2.1294951	2.3689032	1.0278330	0.8391193					
547	0.5564516	0.5564514	0.8426768	0.4705464	0.1479445	-0.4498791	-0.3016667	0.5978236	0.2988386	0.4996425	0.7853981	1.4685431
	1.0485645	0.2502667	0.4760238	2.1295452	2.3694105	1.0268364	0.8379020					
548	0.5555887	0.5555884	0.8420387	0.4696079	0.1476243	-0.4507926	-0.3022403	0.5984169	0.2990755	0.4996164	0.7853981	1.4666719
	1.0470505	0.2507086	0.4754957	2.1296053	2.3699188	1.0258389	0.8366838					
549	0.5547244	0.5547242	0.8414009	0.4685691	0.1473041	-0.4517003	-0.3028053	0.5990043	0.2993140	0.4995903	0.7853981	1.4648228
	1.0455351	0.2511517	0.4749661	2.1296654	2.3704301	1.0248423	0.8354635					
550	0.5538605	0.5538603	0.8407618	0.4677299	0.1469839	-0.4526126	-0.3033814	0.5995965	0.2995508	0.4995642	0.7853981	1.4629622
	1.0440187	0.2515951	0.4744358	2.1297264	2.3709412	1.0238447	0.8342443					
551	0.5529965	0.5529962	0.8401221	0.4667906	0.1466636	-0.4535247	-0.3039532	0.6001883	0.2997874	0.4995381	0.7853981	1.4611053
	1.0425024	0.2520393	0.4739046	2.1297874	2.3714523	1.0228462	0.8330241					
552	0.5521321	0.5521319	0.8394811	0.4658514	0.1463434	-0.4544364	-0.3045247	0.6007758	0.3000228	0.4995120	0.7853981	1.4592524
	1.0409861	0.2524835	0.4733731	2.1298485	2.3719635	1.0218477	0.8318041					
553	0.5512655	0.5512657	0.8388369	0.4649117	0.1460232	-0.4553422	-0.3050921	0.6013653	0.3002566	0.4994859	0.7853981	1.4574213
	1.0394650	0.2529274	0.4728415	2.1299095	2.3724766	1.0208464	0.8305812					
554	0.5504018	0.5504016	0.8381932	0.4639722	0.1457033	-0.4562520	-0.3056617	0.6019549	0.3004894	0.4994602	0.7853981	1.4555807
	1.0379467	0.2533723	0.4723087	2.1299715	2.3729897	1.0198460	0.8293613					
555	0.5495358	0.5495355	0.8375511	0.4630322	0.1453827	-0.4571534	-0.3062257	0.6025361	0.3007250	0.4994341	0.7853981	1.4537706
	1.0364256	0.2538189	0.4717739	2.1300344	2.3735075	1.0188465	0.8281387					
556	0.5486650	0.5486647	0.8369055	0.4620920	0.1450625	-0.4580601	-0.3067932	0.6031227	0.3009582	0.4994084	0.7853981	1.4519453
	1.0349026	0.2542649	0.4712393	2.1300974	2.3740225	1.0178442	0.8269151					
557	0.5478033	0.5478033	0.8362608	0.4611515	0.1447423	-0.4589712	-0.3073630	0.6037135	0.3011911	0.4993823	0.7853981	1.4501104
	1.0333824	0.2547125	0.4707030	2.1301603	2.3745384	1.0168428	0.8256934					
558	0.5469357	0.5469355	0.8356140	0.4602110	0.1444221	-0.4598678	-0.3079297	0.6042859	0.3014236	0.4993566	0.7853981	1.4483232
	1.0318565	0.2551595	0.4701667	2.1302233	2.3750582	1.0158396	0.8244683					
559	0.5460581	0.5460673	0.8349667	0.4592701	0.1441018	-0.4607733	-0.3084893	0.6048751	0.3016558	0.4993309	0.7853981	1.4465122
	1.0303316	0.2556077	0.4696291	2.1302872	2.3755770	1.0148363	0.8232436					
560	0.5452014	0.5452014	0.8343183	0.4583291	0.1437816	-0.4616768	-0.3090535	0.6054584	0.3018861	0.4993048	0.7853981	1.4447107
	1.0288086	0.2560562	0.4690908	2.1303511	2.3760958	1.0138330	0.8220204					
561	0.5443345	0.5443347	0.8336685	0.4573880	0.1434613	-0.4625853	-0.3096209	0.6060467	0.3021151	0.4992794	0.7853981	1.4428959
	1.0272837	0.2565050	0.4685522	2.1304150	2.3766136	1.0128279	0.8207971					
562	0.5434656	0.5434654	0.8330173	0.4564469	0.1431412	-0.4634935	-0.3101817	0.6066247	0.3023447	0.4992535	0.7853981	1.4411163
	1.0257545	0.2569538	0.4680129	2.1304798	2.3771353	1.0118217	0.8195693					
563	0.5425962	0.5425959	0.8323652	0.4555054	0.1428210	-0.4643805	-0.3107412	0.6072014	0.3025737	0.4992277	0.7853981	1.4393425
	1.0242252	0.2574034	0.4674727	2.1305447	2.3776588	1.0108156	0.8183424					
564	0.5417276	0.5417274	0.8317137	0.4545637	0.1425007	-0.4652795	-0.3113019	0.6077802	0.3028026	0.4992023	0.7853981	1.4375668
	1.0226965	0.2578543	0.4669308	2.1306105	2.3781824	1.0098095	0.8171164					
565	0.5408588	0.5408577	0.8310597	0.4536219	0.1421804	-0.4661832	-0.3118633	0.6083606	0.3030298	0.4991767	0.7853981	1.4357882
	1.0211668	0.2583048	0.4663890	2.1306753	2.3787059	1.0088015	0.8158897					
566	0.5399886	0.5399884	0.8303967	0.4526797	0.1418602	-0.4670789	-0.3124236	0.6089391	0.3032581	0.4991509	0.7853981	1.4340181
	1.0196362	0.2587569	0.4658453	2.1307411	2.3792315	1.0077953	0.8146616					
567	0.5390242	0.5390239	0.8297516	0.4517374	0.1415400	-0.4679667	-0.3129776	0.6095067	0.3034879	0.4991229	0.7853981	1.4322670
	1.0179386	0.2591984	0.4653014	2.1308155	2.3797114	1.0067863	0.8133332					

	1.0165663	0.2556674	0.4647573	2.1309356	2.3802862	1.0057764	0.8122004	[illegible]	0.3331117	0.4991000	0.7853981	1.4305298
569	0.5372813	0.5372811	0.8284377	0.4498524	0.1408995	-0.4693265	-0.3138155	0.6102260	0.3039996	0.4990718	0.7853981	1.4300919
	1.0148681	0.2601038	0.4642116	2.1309490	2.3809690	1.0047674	0.8108400					
570	0.5364050	0.5364048	0.8277783	0.4489095	0.1405793	-0.4702228	-0.3143734	0.6108021	0.3042238	0.4990461	0.7853981	1.4283400
	1.0133324	0.2605566	0.4636657	2.1310167	2.3814974	1.0037556	0.8096086					
571	0.5355370	0.5355368	0.8271195	0.4479664	0.1402591	-0.4711128	-0.3149271	0.6113719	0.3044484	0.4990208	0.7853981	1.4266050
	1.0117950	0.2610108	0.4631183	2.1310854	2.3820286	1.0027447	0.8083777					
572	0.5346646	0.5346644	0.8264593	0.4471234	0.1399389	-0.4720044	-0.3154812	0.6119433	0.3046719	0.4989954	0.7853981	1.4248753
	1.0102577	0.2614649	0.4625705	2.1311531	2.3825588	1.0017328	0.8071464					
573	0.5337914	0.5337911	0.8257984	0.4462795	0.1396196	-0.4728935	-0.3160434	0.6125121	0.3048957	0.4989702	0.7853981	1.4231529
	1.0087185	0.2619203	0.4620212	2.1312218	2.3830919	1.0007200	0.8059137					
574	0.5329197	0.5329195	0.8251383	0.4454360	0.1392984	-0.4737898	-0.3166008	0.6130882	0.3051189	0.4989448	0.7853981	1.4214115
	1.0071821	0.2623768	0.4614706	2.1312904	2.3836241	0.9997072	0.8046824					
575	0.5320441	0.5320445	0.8244748	0.4445918	0.1389782	-0.4746749	-0.3171405	0.6136531	0.3053415	0.4989195	0.7853981	1.4197073
	1.0056391	0.2628326	0.4609200	2.1313611	2.3841591	0.9986948	0.8034482					
576	0.5311726	0.5311723	0.8238125	0.4437477	0.1386590	-0.4755701	-0.3176964	0.6142281	0.3055632	0.4988942	0.7853981	1.4179745
	1.0041006	0.2632902	0.4603676	2.1314297	2.3846922	0.9976820	0.8022173					
577	0.5302977	0.5302975	0.8231490	0.4429032	0.1383377	-0.4764542	-0.3182457	0.6147919	0.3057855	0.4988689	0.7853981	1.4162388
	1.0025578	0.2637480	0.4598145	2.1314993	2.3852311	0.9966681	0.8009824					
578	0.5294220	0.5294218	0.8224830	0.4413581	0.1380175	-0.4773378	-0.3187931	0.6153553	0.3060062	0.4988436	0.7853981	1.4145861
	1.0010128	0.2642057	0.4592613	2.1315699	2.3857679	0.9956523	0.7997462					
579	0.5285477	0.5285475	0.8218157	0.4404141	0.1376973	-0.4782285	-0.3193455	0.6159258	0.3062246	0.4988186	0.7853981	1.4128761
	0.9994700	0.2646637	0.4587074	2.1316404	2.3863039	0.9946355	0.7985122					
580	0.5276725	0.5276723	0.8211485	0.4394690	0.1373771	-0.4791184	-0.3198971	0.6164955	0.3064443	0.4987932	0.7853981	1.4111700
	0.9979261	0.2651232	0.4581516	2.1317110	2.3868418	0.9936193	0.7972769					
581	0.5267966	0.5267964	0.8204815	0.4385235	0.1370568	-0.4800011	-0.3204433	0.6170570	0.3066640	0.4987683	0.7853981	1.4094915
	0.9963781	0.2655836	0.4575947	2.1317815	2.3873835	0.9926027	0.7960406					
582	0.5259202	0.5259200	0.8198143	0.4375781	0.1367366	-0.4808811	-0.3209888	0.6176177	0.3068843	0.4987430	0.7853981	1.4078188
	0.9948327	0.2660446	0.4570367	2.1318541	2.3879261	0.9915867	0.7948035					
583	0.5250456	0.5250456	0.8191429	0.4366327	0.1364164	-0.4817749	-0.3215423	0.6181913	0.3070991	0.4987181	0.7853981	1.4061089
	0.9932875	0.2665048	0.4564794	2.1319265	2.3884630	0.9905671	0.7935693					
584	0.5241680	0.5241677	0.8184710	0.4356871	0.1360962	-0.4826577	-0.3220887	0.6187539	0.3073158	0.4986932	0.7853981	1.4044361
	0.9917377	0.2669656	0.4559209	2.1319990	2.3890057	0.9895473	0.7923303					
585	0.5232906	0.5232903	0.8177968	0.4347408	0.1357759	-0.4835374	-0.3226328	0.6193133	0.3075303	0.4986682	0.7853981	1.4027739
	0.9901865	0.2674268	0.4553617	2.1320724	2.3895493	0.9885255	0.7910919					
586	0.5224125	0.5224122	0.8171239	0.4337949	0.1354557	-0.4844161	-0.3231761	0.6198719	0.3077463	0.4986432	0.7853981	1.4011183
	0.9886357	0.2678890	0.4548011	2.1321459	2.3900948	0.9875053	0.7898525					
587	0.5215340	0.5215338	0.8164501	0.4328483	0.1351355	-0.4852914	-0.3237168	0.6204268	0.3079619	0.4986183	0.7853981	1.3994751
	0.9870821	0.2683524	0.4542391	2.1322203	2.3906422	0.9864843	0.7886127					
588	0.5206562	0.5206561	0.8157747	0.4319017	0.1348153	-0.4861800	-0.3242662	0.6209953	0.3081755	0.4985934	0.7853981	1.3977547
	0.9855312	0.2688158	0.4536766	2.1322947	2.3911858	0.9854623	0.7873739					
589	0.5197763	0.5197760	0.8150982	0.4309546	0.1344950	-0.4870544	-0.3248060	0.6215494	0.3083897	0.4985685	0.7853981	1.3961582
	0.9839755	0.2692798	0.4531131	2.1323691	2.3917351	0.9844393	0.7861317					
590	0.5188965	0.5188962	0.8144208	0.4300076	0.1341748	-0.4879342	-0.3253494	0.6221090	0.3086029	0.4985435	0.7853981	1.3945093
	0.9824203	0.2697443	0.4525489	2.1324434	2.3922834	0.9834158	0.7848899					
591	0.5180178	0.5180176	0.8137427	0.4290603	0.1338546	-0.4888099	-0.3258896	0.6226645	0.3088147	0.4985189	0.7853981	1.3928757
	0.9808654	0.2702096	0.4519835	2.1325197	2.3928328	0.9823919	0.7836499					
592	0.5171376	0.5171373	0.8130648	0.4281127	0.1335344	-0.4896879	-0.3264312	0.6232222	0.3090279	0.4984940	0.7853981	1.3912363
	0.9793085	0.2706761	0.4514166	2.1325941	2.3933840	0.9813684	0.7824075					
593	0.5162562	0.5162561	0.8123856	0.4271645	0.1332141	-0.4905605	-0.3269692	0.6237746	0.3092407	0.4984695	0.7853981	1.3896160
	0.9777485	0.2711434	0.4508484	2.1326714	2.3939381	0.9803437	0.7811637					
594	0.5153764	0.5153762	0.8117052	0.4262168	0.1328939	-0.4914398	-0.3275111	0.6243337	0.3094512	0.4984449	0.7853981	1.3879786
	0.9761916	0.2716105	0.4502801	2.1327477	2.3944933	0.9793185	0.7799219					
595	0.5144965	0.5144963	0.8110220	0.4252686	0.1325737	-0.4923138	-0.3280497	0.6248875	0.3096607	0.4984200	0.7853981	1.3863592
	0.9746317	0.2720776	0.4497114	2.1328239	2.3950424	0.9782910	0.7786772					
596	0.5136130	0.5136127	0.8103395	0.4243200	0.1322535	-0.4931840	-0.3285854	0.6254375	0.3098704	0.4983954	0.7853981	1.3847542
	0.9731704	0.2725461	0.4491410	2.1329012	2.3955984	0.9772640	0.7774330					
597	0.5127315	0.5127313	0.8096576	0.4233712	0.1319332	-0.4940594	-0.3291243	0.6259527	0.3100811	0.4983709	0.7853981	1.3831348
	0.9715101	0.2730161	0.4485687	2.1329794	2.3961544	0.9762380	0.7761889					
598	0.5118486	0.5118484	0.8089734	0.4224223	0.1316130	-0.4949294	-0.3296598	0.6265424	0.3102903	0.4983463	0.7853981	1.3815346
	0.9699455	0.2734859	0.4479961	2.1330576	2.3967133	0.9752101	0.7749429					
599	0.5109658	0.5109656	0.8082874	0.4214730	0.1312928	-0.4958061	-0.3301891	0.6270989	0.3104979	0.4983217	0.7853981	1.3799181
	0.9683826	0.2739561	0.4474229	2.1331358	2.3972692	0.9741808	0.7736979					
600	0.5100820	0.5100818	0.8076020	0.4205235	0.1309726	-0.4966715	-0.3307309	0.6276441	0.3107048	0.4982972	0.7853981	1.3783360
	0.9668167	0.2744276	0.4468479	2.1332151	2.3978319	0.9731522	0.7724496					
601	0.5091980	0.5091986	0.8069141	0.4195738	0.1306523	-0.4975451	-0.3312680	0.6281974	0.3109130	0.4982726	0.7853981	1.3767319
	0.9652518	0.2748989	0.4462727	2.1332941	2.3983898	0.9721217	0.7712033					
602	0.5083144	0.5083141	0.8062262	0.4186240	0.1303321	-0.4984008	-0.3317992	0.6287419	0.3111202	0.4982485	0.7853981	1.3751564
	0.9636841	0.2753713	0.4456962	2.1333742	2.3989525	0.9710913	0.7699549					
603	0.5074301	0.5074298	0.8055363	0.4176739	0.1300119	-0.4992700	-0.3323328	0.6292868	0.3113253	0.4982239	0.7853981	1.3735704
	0.9621164	0.2758439	0.4451190	2.1334543	2.3995142	0.9700595	0.7687070					

604	0.5065451	0.5065448	0.8048472	0.4167236	0.1296917	-0.5001454	-0.3228648	0.6298370	0.3115317	0.4981994	0.7853981	1.3719959
	0.9605482	0.2763177	0.4445401	2.1335344	2.4000780	0.9690285	0.7674581					
605	0.5056597	0.5056595	0.8041551	0.4157727	0.1293714	-0.5010130	-0.3333969	0.6303844	0.3117356	0.4981752	0.7853981	1.3704185
	0.9589775	0.2767517	0.4439607	2.1336155	2.4006433	0.9679949	0.7662085					
606	0.5047733	0.5047731	0.8034638	0.4148220	0.1290512	-0.5018764	-0.3339267	0.6309276	0.3119408	0.4981510	0.7853981	1.3688564
	0.9574054	0.2772667	0.4433799	2.1336975	2.4012108	0.9669623	0.7649575					
607	0.5038877	0.5038875	0.8027699	0.4138711	0.1287310	-0.5027456	-0.3344555	0.6314776	0.3121433	0.4981264	0.7853981	1.3672890
	0.9558355	0.2777416	0.4427989	2.1337786	2.4017754	0.9659278	0.7637073					
608	0.5030016	0.5030016	0.8020757	0.4129199	0.1284108	-0.5036119	-0.3349503	0.6320226	0.3123457	0.4981022	0.7853981	1.3657150
	0.9542628	0.2782176	0.4422163	2.1338615	2.4023428	0.9648931	0.7624576					
609	0.5021133	0.5021130	0.8013785	0.4119681	0.1280905	-0.5044740	-0.3355178	0.6325635	0.3125472	0.4980781	0.7853981	1.3641653
	0.9526863	0.2786934	0.4416334	2.1339445	2.4029121	0.9638559	0.7612037					
610	0.5012270	0.5012268	0.8006837	0.4110163	0.1277703	-0.5053387	-0.3360480	0.6331090	0.3127494	0.4980539	0.7853981	1.3626070
	0.9511132	0.2791714	0.4410481	2.1340275	2.4034824	0.9628211	0.7599530					
611	0.5003393	0.5003390	0.7999880	0.4100640	0.1274500	-0.5062008	-0.3365756	0.6336508	0.3129519	0.4980297	0.7853981	1.3610601
	0.9495377	0.2796502	0.4404616	2.1341114	2.4040546	0.9617856	0.7587001					
612	0.4994501	0.4994499	0.7992913	0.4091117	0.1271299	-0.5070601	-0.3371013	0.6341899	0.3131543	0.4980056	0.7853981	1.3595228
	0.9479656	0.2801295	0.4398741	2.1341944	2.4046288	0.9607496	0.7574453					
613	0.4985622	0.4985620	0.7985921	0.4081594	0.1268096	-0.5079188	-0.3376264	0.6347284	0.3133536	0.4979817	0.7853981	1.3579903
	0.9463917	0.2806084	0.4392865	2.1342793	2.4052029	0.9597115	0.7561925					
614	0.4976731	0.4976729	0.7978913	0.4072065	0.1264894	-0.5087789	-0.3381520	0.6352683	0.3135523	0.4979576	0.7853981	1.3564558
	0.9448215	0.2810891	0.4386978	2.1343651	2.4057779	0.9586722	0.7549376					
615	0.4967830	0.4967828	0.7971904	0.4062535	0.1261691	-0.5096395	-0.3386781	0.6358086	0.3137517	0.4979334	0.7853981	1.3549223
	0.9432515	0.2815687	0.4381077	2.1344500	2.4063530	0.9576330	0.7536816					
616	0.4958935	0.4958932	0.7964892	0.4053002	0.1258489	-0.5104962	-0.3392012	0.6363451	0.3139504	0.4979096	0.7853981	1.3534721
	0.9416802	0.2820504	0.4375163	2.1345367	2.4069309	0.9565938	0.7524264					
617	0.4950032	0.4950030	0.7957875	0.4043466	0.1255287	-0.5113556	-0.3397260	0.6368843	0.3141491	0.4978858	0.7853981	1.3518763
	0.9400584	0.2825329	0.4369234	2.1346226	2.4075098	0.9555543	0.7511711					
618	0.4941122	0.4941120	0.7950838	0.4033928	0.1252085	-0.5122139	-0.3402469	0.6374224	0.3143466	0.4978617	0.7853981	1.3503561
	0.9384760	0.2830156	0.4363301	2.1347084	2.4080887	0.9545133	0.7499129					
619	0.4932211	0.4932209	0.7943777	0.4024386	0.1248882	-0.5130689	-0.3407712	0.6379571	0.3145429	0.4978378	0.7853981	1.3488474
	0.9368908	0.2834986	0.4357359	2.1347961	2.4086695	0.9534703	0.7486553					
620	0.4923299	0.4923293	0.7936710	0.4014847	0.1245680	-0.5139266	-0.3412944	0.6384946	0.3147368	0.4978141	0.7853981	1.3473330
	0.9353052	0.2839817	0.4351413	2.1348835	2.4092503	0.9524271	0.7473972					
621	0.4914368	0.4914365	0.7929636	0.4005300	0.1242478	-0.5147781	-0.3418133	0.6390259	0.3149322	0.4977902	0.7853981	1.3458085
	0.9337181	0.2844661	0.4345448	2.1349716	2.4098339	0.9513834	0.7461374					
622	0.4905444	0.4905441	0.7922553	0.3995754	0.1239276	-0.5156320	-0.3423336	0.6395596	0.3151265	0.4977665	0.7853981	1.3443394
	0.9321300	0.2849512	0.4339473	2.1350613	2.4104185	0.9503392	0.7448782					
623	0.4896517	0.4896514	0.7915455	0.3986274	0.1236073	-0.5164872	-0.3428543	0.6400946	0.3153201	0.4977427	0.7853981	1.3428383
	0.9305426	0.2854369	0.4333498	2.1351500	2.4110022	0.9492941	0.7436185					
624	0.4887581	0.4887578	0.7908351	0.3976652	0.1232871	-0.5173398	-0.3433734	0.6406279	0.3155128	0.4977189	0.7853981	1.3413477
	0.9289525	0.2859230	0.4327494	2.1352396	2.4115887	0.9482481	0.7423576					
625	0.4878634	0.4878634	0.7901234	0.3967099	0.1229669	-0.5181890	-0.3438859	0.6411559	0.3157055	0.4976951	0.7853981	1.3398676
	0.9273602	0.2864058	0.4321488	2.1353292	2.4121771	0.9472016	0.7410954					
626	0.4869695	0.4869696	0.7894129	0.3957538	0.1226467	-0.5190434	-0.3444099	0.6416901	0.3158987	0.4976717	0.7853981	1.3383760
	0.9257656	0.2868887	0.4315457	2.1354198	2.4127655	0.9461561	0.7398343					
627	0.4860746	0.4860746	0.7887008	0.3947976	0.1223264	-0.5198920	-0.3449258	0.6422185	0.3160916	0.4976478	0.7853981	1.3369017
	0.9241770	0.2873878	0.4309420	2.1355104	2.4133568	0.9451095	0.7385713					
628	0.4851800	0.4851798	0.7879874	0.3938414	0.1220062	-0.5207399	-0.3454419	0.6427461	0.3162830	0.4976245	0.7853981	1.3354321
	0.9225882	0.2878775	0.4303374	2.1356030	2.4139490	0.9440622	0.7373087					
629	0.4842845	0.4842846	0.7872730	0.3928847	0.1216860	-0.5215942	-0.3459567	0.6432751	0.3164738	0.4976006	0.7853981	1.3339605
	0.9209885	0.2883679	0.4297314	2.1356945	2.4145412	0.9431140	0.7360456					
630	0.4833885	0.4833882	0.7865579	0.3919278	0.1213658	-0.5224360	-0.3464710	0.6438018	0.3166648	0.4975773	0.7853981	1.3324976
	0.9193925	0.2888592	0.4291241	2.1357870	2.4151363	0.9419653	0.7347808					
631	0.4824927	0.4824922	0.7858409	0.3909708	0.1210455	-0.5232875	-0.3469879	0.6443331	0.3168538	0.4975538	0.7853981	1.3310242
	0.9177961	0.2893506	0.4285163	2.1358795	2.4157305	0.9409153	0.7335166					
632	0.4815955	0.4815956	0.7851240	0.3900133	0.1207253	-0.5241356	-0.3475024	0.6448609	0.3170425	0.4975303	0.7853981	1.3295622
	0.9161987	0.2898434	0.4279067	2.1359730	2.4163255	0.9398656	0.7322515					
633	0.4806978	0.4806976	0.7844043	0.3890556	0.1204051	-0.5249809	-0.3480151	0.6453860	0.3172316	0.4975066	0.7853981	1.3281107
	0.9145985	0.2903361	0.4272966	2.1360664	2.4169245	0.9389136	0.7309843					
634	0.4797995	0.4797996	0.7836838	0.3880979	0.1200849	-0.5258225	-0.3485259	0.6459074	0.3174186	0.4974832	0.7853981	1.3266697
	0.9129966	0.2908252	0.4266856	2.1361609	2.4175234	0.9377611	0.7297174					
635	0.4789022	0.4789018	0.7829632	0.3871398	0.1197646	-0.5266721	-0.3490401	0.6464268	0.3176057	0.4974598	0.7853981	1.3252456
	0.9113975	0.2913238	0.4260728	2.1362562	2.4181223	0.9367087	0.7284506					
636	0.4780032	0.4780030	0.7822410	0.3861814	0.1194444	-0.5275176	-0.3495458	0.6469529	0.3177921	0.4974367	0.7853981	1.3237906
	0.9097934	0.2918187	0.4254591	2.1363525	2.4187260	0.9356553	0.7271925					
637	0.4771039	0.4771037	0.7815174	0.3852228	0.1191242	-0.5283532	-0.3500579	0.6474773	0.3179773	0.4974133	0.7853981	1.3223457
	0.9081931	0.2923141	0.4248444	2.1364479	2.4193277	0.9345917	0.7259136					
638	0.4762045	0.4762046	0.7807929	0.3842643	0.1188040	-0.5292033	-0.3505704	0.6480043	0.3181618	0.4973899	0.7853981	1.3208990
	0.9065872	0.2928104	0.4242285	2.1365442	2.4199295	0.9335455	0.7246451					
639	0.4753041	0.4753038	0.7800674	0.3833044	0.1184837	-0.5300373	-0.3510767	0.6485210	0.3183466	0.4973668	0.7853981	1.3194809
	0.9049796	0.2933077	0.4236119	2.1366405	2.4205360	0.9324996	0.7233741					

	0.9033342	0.2938066	0.4229914	2.1367388	0.1211932	0.9314554	0.7221745				
641	0.4735034	0.4735032	0.7786156	0.3813853	0.1178433	-0.5317196	-0.3520937	0.6495628	0.3187147	0.4973204	0.7853981	1.3166294
	0.9017661	0.2943050	0.4223719	2.1368370	2.4217561	0.9332779	0.7208337				
642	0.4726011	0.4726015	0.7778884	0.3804250	0.1175230	-0.5325597	-0.3526012	0.6500827	0.3188987	0.4972973	0.7853981	1.3152094
	0.9021572	0.2940649	0.4217502	2.1369352	2.4223595	0.9293211	0.7195615				
643	0.4716957	0.4716955	0.7771600	0.3794647	0.1172028	-0.5333940	-0.3531948	0.6505969	0.3190818	0.4972743	0.7853981	1.3138065
	0.8985470	0.2953055	0.4211276	2.1370315	2.4229717	0.9282637	0.7182989				
644	0.4707911	0.4707975	0.7764307	0.3785040	0.1169826	-0.5342362	-0.3536134	0.6511188	0.3192640	0.4972512	0.7853981	1.3123856
	0.8969351	0.2950069	0.4205035	2.1371336	2.4235830	0.9272055	0.7170163				
645	0.4699955	0.4698952	0.7757220	0.3775429	0.1165624	-0.5350724	-0.3541100	0.6516348	0.3194473	0.4972282	0.7853981	1.3109808
	0.8953241	0.2963055	0.4198774	2.1372337	2.4241972	0.9261482	0.7157434				
646	0.4689922	0.4689921	0.7749707	0.3765615	0.1162421	-0.5359352	-0.3546203	0.6521473	0.3196286	0.4972051	0.7853981	1.3095894
	0.8937106	0.2964131	0.4192517	2.1373348	2.4249133	0.9250887	0.7144691				
647	0.4682875	0.4680873	0.7742375	0.3756203	0.1159219	-0.5367374	-0.3551216	0.6526594	0.3198095	0.4971821	0.7853981	1.3081999
	0.8920945	0.2973162	0.4186233	2.1374359	2.4254303	0.9240282	0.7131925				
648	0.4671841	0.4671844	0.7735334	0.3746595	0.1156017	-0.5375797	-0.3556293	0.6531814	0.3199877	0.4971591	0.7853981	1.3067846
	0.8904811	0.2978202	0.4179947	2.1375380	2.4260445	0.9229663	0.7119191				
649	0.4662800	0.4662798	0.7727692	0.3736966	0.1152815	-0.5384138	-0.3561317	0.6536953	0.3201675	0.4971361	0.7853981	1.3053542
	0.8888660	0.2983254	0.4173645	2.1376390	2.4266634	0.9219151	0.7106428				
650	0.4653747	0.4653745	0.7720339	0.3727341	0.1149612	-0.5392444	-0.3566315	0.6542056	0.3203468	0.4971133	0.7853981	1.3040152
	0.8872469	0.2988215	0.4167326	2.1377430	2.4272852	0.9208429	0.7093655				
651	0.4644691	0.4644689	0.7712986	0.3717715	0.1146419	-0.5401773	-0.3571329	0.6547183	0.3205264	0.4970903	0.7853981	1.3026323
	0.8856291	0.2993288	0.4160992	2.1378450	2.4279070	0.9197812	0.7080878				
652	0.4635641	0.4635639	0.7705601	0.3708087	0.1143208	-0.5410096	-0.3576334	0.6552303	0.3207025	0.4970676	0.7853981	1.3012514
	0.8840098	0.2998458	0.4154656	2.1379455	2.4285288	0.9187167	0.7068111				
653	0.4626566	0.4626566	0.7698204	0.3698457	0.1140006	-0.5417386	-0.3581318	0.6557392	0.3208789	0.4970450	0.7853981	1.2998819
	0.8823874	0.3003432	0.4148305	2.1380539	2.4291534	0.9176514	0.7055311				
654	0.4617500	0.4617457	0.7690806	0.3688819	0.1136803	-0.5425729	-0.3586334	0.6562532	0.3210552	0.4970219	0.7853981	1.2985001
	0.8807657	0.3008425	0.4141937	2.1381588	2.4297781	0.9165861	0.7042519				
655	0.4608425	0.4608427	0.7683412	0.3679183	0.1133601	-0.5434013	-0.3591311	0.6567614	0.3212321	0.4969992	0.7853981	1.2971369
	0.8791425	0.3013728	0.4135552	2.1382647	2.4304056	0.9155216	0.7029724				
656	0.4599352	0.4599351	0.7676009	0.3669539	0.1130399	-0.5442313	-0.3596294	0.6572711	0.3214087	0.4969766	0.7853981	1.2957697
	0.8775156	0.3018742	0.4129149	2.1383705	2.4310350	0.9144563	0.7016919				
657	0.4590272	0.4590270	0.7668590	0.3659898	0.1127197	-0.5450562	-0.3601245	0.6577758	0.3215840	0.4969543	0.7853981	1.2944183
	0.8758934	0.3023759	0.4122740	2.1384773	2.4316664	0.9133901	0.7004109				
658	0.4581184	0.4581182	0.7661152	0.3650249	0.1123994	-0.5458890	-0.3606237	0.6582874	0.3217582	0.4969313	0.7853981	1.2930508
	0.8742684	0.3029082	0.4116317	2.1385841	2.4322958	0.9123222	0.6991289				
659	0.4572097	0.4572095	0.7653716	0.3640595	0.1120792	-0.5467164	-0.3611245	0.6587956	0.3219326	0.4969090	0.7853981	1.2916937
	0.8726412	0.3034229	0.4109876	2.1386919	2.4329309	0.9112548	0.6978470				
660	0.4563003	0.4563003	0.7646274	0.3630946	0.1117589	-0.5475419	-0.3616152	0.6593009	0.3221066	0.4968863	0.7853981	1.2903461
	0.8710136	0.3039365	0.4103422	2.1388036	2.4335642	0.9101871	0.6965645				
661	0.4553901	0.4553901	0.7638816	0.3621290	0.1114389	-0.5483670	-0.3621057	0.6598058	0.3222800	0.4968640	0.7853981	1.2890019
	0.8693835	0.3044516	0.4096954	2.1389193	2.4342003	0.9091182	0.6952816				
662	0.4544797	0.4544795	0.7631359	0.3611630	0.1111185	-0.5491915	-0.3626034	0.6603100	0.3224540	0.4968413	0.7853981	1.2876808
	0.8677526	0.3049683	0.4090467	2.1390350	2.4348383	0.9080495	0.6939961				
663	0.4535587	0.4535585	0.7623883	0.3601968	0.1107983	-0.5500128	-0.3630959	0.6608111	0.3226264	0.4968190	0.7853981	1.2863293
	0.8661202	0.3054851	0.4083972	2.1391496	2.4354782	0.9069796	0.6927109				
664	0.4526581	0.4526579	0.7616392	0.3592302	0.1104781	-0.5508302	-0.3635894	0.6613172	0.3227931	0.4967963	0.7853981	1.2849865
	0.8644893	0.3060028	0.4077464	2.1392643	2.4361172	0.9059084	0.6914265				
665	0.4516781	0.4516779	0.7608891	0.3582637	0.1101578	-0.5516491	-0.3640801	0.6618210	0.3229532	0.4967723	0.7853981	1.2844839
	0.8627334	0.3065119	0.4070944	2.1393795	2.4367782	0.9048367	0.6900449				
666	0.4507323	0.4507321	0.7601374	0.3572966	0.1098376	-0.5524766	-0.3645685	0.6623142	0.3231085	0.4967517	0.7853981	1.2823467
	0.8612168	0.3070357	0.4064411	2.1394934	2.4374046	0.9037638	0.6888511				
667	0.4498522	0.4498521	0.7593839	0.3563293	0.1095174	-0.5533088	-0.3648682	0.6625062	0.3233516	0.4967276	0.7853981	1.2818396
	0.8594604	0.3075491	0.4057969	2.1395845	2.4381666	0.9026894	0.6874696				
668	0.4489384	0.4489382	0.7586302	0.3553617	0.1091971	-0.5538179	-0.3653516	0.6630051	0.3235204	0.4967054	0.7853981	1.2805214
	0.8578224	0.3080695	0.4051309	2.1396680	2.4388132	0.9016151	0.6861796				
669	0.4480235	0.4480233	0.7578745	0.3543938	0.1088769	-0.5546220	-0.3658428	0.6634985	0.3236887	0.4966831	0.7853981	1.2792187
	0.8561805	0.3085876	0.4044735	2.1397525	2.4394627	0.9005397	0.6848891				
670	0.4471091	0.4471089	0.7571201	0.3534254	0.1085567	-0.5554421	-0.3663332	0.6639908	0.3238569	0.4966608	0.7853981	1.2779016
	0.8545416	0.3091133	0.4038141	2.1398260	2.4401121	0.8994649	0.6835993				
671	0.4461941	0.4461938	0.7563642	0.3524568	0.1082365	-0.5562596	-0.3668209	0.6644961	0.3240249	0.4966389	0.7853981	1.2765932
	0.8529002	0.3096369	0.4031533	2.1400414	2.4407635	0.8983894	0.6823087				
672	0.4452755	0.4452752	0.7556066	0.3514882	0.1079162	-0.5570788	-0.3673094	0.6649950	0.3241907	0.4966166	0.7853981	1.2752819
	0.8512592	0.3101607	0.4024916	2.1401577	2.4414148	0.8973127	0.6810187				
673	0.4443623	0.4443621	0.7548461	0.3505199	0.1075960	-0.5578992	-0.3677953	0.6654863	0.3243558	0.4965947	0.7853981	1.2739525
	0.8496135	0.3106846	0.4018290	2.1402740	2.4420691	0.8962336	0.6797251				
674	0.4434466	0.4434457	0.7541885	0.3495491	0.1072758	-0.5587060	-0.3682791	0.6659818	0.3245232	0.4965723	0.7853981	1.2726936
	0.8479655	0.3112117	0.4011626	2.1403904	2.4427261	0.8951572	0.6784326				
675	0.4425253	0.4425250	0.7533294	0.3485753	0.1069556	-0.5595195	-0.3687637	0.6664751	0.3246894	0.4965504	0.7853981	1.2714024
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716	0.4045105	0.4045101	0.7212757	0.3085341	0.0938263	-0.5923356	-0.3881282	0.6861619	0.3309855	0.4956758	0.7853981	1.2211437
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	0.7761585	0.3347056	0.3710527	2.1460848	2.4724979	-0.8481941	-0.6222062					
718	0.4026333	0.4026333	0.7196671	0.3065692	0.0931858	-0.5938935	-0.3890442	0.6870894	0.3312683	0.4956345	0.7853981	1.2188058
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719	0.4016946	0.4016944	0.7184615	0.3055839	0.0928656	-0.5946894	-0.3895032	0.6875550	0.3314052	0.4956141	0.7853981	1.2176390
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725	0.3960481	0.3960481	0.7140017	0.2996692	0.0909443	-0.5993869	-0.3922422	0.6903312	0.3322397	0.4954914	0.7853981	1.2108097
	0.7625548	0.3352839	0.3650944	2.1473064	2.4784079	-0.8393213	-0.6116005					
726	0.3951051	0.3951049	0.7131890	0.2986820	0.0906240	-0.6001669	-0.3926961	0.6907909	0.3323774	0.4954712	0.7853981	1.2096767
	0.7608475	0.3399610	0.3643404	2.1474628	2.4791565	-0.8382099	-0.6102719					
727	0.3941616	0.3941616	0.7123742	0.2976947	0.0903038	-0.6009464	-0.3931498	0.6912503	0.3325131	0.4954508	0.7853981	1.2085457
	0.7591410	0.3404384	0.3635854	2.1476202	2.4799061	-0.8370970	-0.6089413					
728	0.3932180	0.3932178	0.7115596	0.2967066	0.0899836	-0.6017250	-0.3936024	0.6917086	0.3326495	0.4954307	0.7853981	1.2074184
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729	0.3922738	0.3922733	0.7107438	0.2957184	0.0896634	-0.6025042	-0.3940557	0.6921676	0.3327854	0.4954106	0.7853981	1.2062912
	0.7557235	0.3415983	0.3620673	2.1479378	2.4814119	-0.8348714	-0.6062797					
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	0.7540121	0.3421808	0.3613046	2.1480980	2.4821701	-0.8337590	-0.6049478					
731	0.3903836	0.3903834	0.7091109	0.2937407	0.0891229	-0.6040573	-0.3949578	0.6930802	0.3330567	0.4953704	0.7853981	1.2040529
	0.7523012	0.3427633	0.3605409	2.1482592	2.4829283	-0.8326448	-0.6036160					
732	0.3894370	0.3894368	0.7082918	0.2927514	0.0887027	-0.6048321	-0.3954076	0.6935348	0.3331913	0.4953503	0.7853981	1.2029400
	0.7505868	0.3433468	0.3597751	2.1484213	2.4836893	-0.8315296	-0.6022817					
733	0.3884904	0.3884903	0.7074698	0.2917618	0.0883825	-0.6056305	-0.3958580	0.6939909	0.3333229	0.4953303	0.7853981	1.2018242
	0.7488726	0.3439306	0.3590082	2.1485844	2.4844503	-0.8304120	-0.6009477					
734	0.3875430	0.3875428	0.7066491	0.2907715	0.0880622	-0.6063823	-0.3963069	0.6944445	0.3334567	0.4953101	0.7853981	1.2007160
	0.7471563	0.3445169	0.3582379	2.1487484	2.4852161	-0.8292960	-0.5996123					
735	0.3865950	0.3865948	0.7058253	0.2897813	0.0877420	-0.6071551	-0.3967547	0.6948972	0.3335877	0.4952901	0.7853981	1.1996117
	0.7454390	0.3451029	0.3574669	2.1489134	2.4859819	-0.8281775	-0.5982763					
736	0.3856466	0.3856466	0.7050021	0.2887904	0.0874218	-0.6079307	-0.3972043	0.6953525	0.3337198	0.4952704	0.7853981	1.1985116
	0.7437205	0.3456912	0.3566928	2.1490753	2.4867506	-0.8270589	-0.5969399					
737	0.3846982	0.3846980	0.7041790	0.2877992	0.0871016	-0.6087129	-0.3976516	0.6958045	0.3338513	0.4952502	0.7853981	1.1974010
	0.7420016	0.3462805	0.3559167	2.1492462	2.4875221	-0.8259419	-0.5956031					
738	0.3837488	0.3837483	0.7033504	0.2868077	0.0867813	-0.6094771	-0.3980998	0.6962584	0.3339802	0.4952306	0.7853981	1.1962967
	0.7402802	0.3468699	0.3551395	2.1494141	2.4882936	-0.8248208	-0.5942646					
739	0.3827989	0.3827985	0.7025232	0.2858158	0.0864611	-0.6102459	-0.3985445	0.6967070	0.3341098	0.4952108	0.7853981	1.1952066
	0.7385577	0.3474609	0.3543597	2.1495838	2.4890690	-0.8237007	-0.5929260					
740	0.3818482	0.3818480	0.7016960	0.2848233	0.0861429	-0.6110192	-0.3989919	0.6971601	0.3342400	0.4951907	0.7853981	1.1941171
	0.7368352	0.3480540	0.3535770	2.1497526	2.4898462	-0.8225807	-0.5915864					
741	0.3808975	0.3808973	0.7008685	0.2838308	0.0858207	-0.6117894	-0.3994371	0.6976101	0.3343701	0.4951710	0.7853981	1.1930161
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742	0.3799459	0.3799453	0.7000372	0.2828375	0.0855004	-0.6125593	-0.3998823	0.6980597	0.3344975	0.4951513	0.7853981	1.1919270
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	0.7316574	0.3498380	0.3512181	2.1502686	2.4921913	-0.8192151	-0.5875632					
744	0.3780401	0.3780399	0.6983742	0.2808509	0.0848600	-0.6140950	-0.4007687	0.6989551	0.3347533	0.4951122	0.7853981	1.1897621
	0.7299282	0.3504358	0.3504266	2.1504421	2.4929799	-0.8180924	-0.5862201					
745	0.3770875	0.3770873	0.6975421	0.2798595	0.0845398	-0.6148640	-0.4012127	0.6994038	0.3348806	0.4950924	0.7853981	1.1886787
	0.7281998	0.3510245	0.3496334	2.1506176	2.4937668	-0.8169711	-0.5848778					
746	0.3761331	0.3761330	0.6967059	0.2788683	0.0842195	-0.6156291	-0.4016537	0.6998496	0.3350054	0.4950727	0.7853981	1.1876059
	0.7264680	0.3516130	0.3488331	2.1507943	2.4945574	-0.8158441	-0.5835329					
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	0.7246478	0.3522232	0.3480423	2.1509730	2.4953414	-0.8147187	-0.5821195					

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	0.7229997	0.3528340	0.3472435	2.1511488	2.4961462	0.8135915	0.5808401					
749	0.3732190	0.3732188	0.6941934	0.2758753	0.0832589	-0.6176965	-0.4028397	0.7009554	0.3354106	0.4950132	0.7853981	1.1849413
	0.7211784	0.3534266	0.3464422	2.1513376	2.4970341	0.8124645	0.5794266					
750	0.3722621	0.3722619	0.6933550	0.2748790	0.0829386	-0.6184583	-0.4032704	0.7013969	0.3355355	0.4949939	0.7853981	1.1838808
	0.7194405	0.3540307	0.3456382	2.1515179	2.4978352	0.8113379	0.5780783					
751	0.3713056	0.3713055	0.6925158	0.2738824	0.0826184	-0.6192222	-0.4037102	0.7018406	0.3356553	0.4949745	0.7853981	1.1828156
	0.7177042	0.3546343	0.3448318	2.1516991	2.4986372	0.8102110	0.5767309					
752	0.3703475	0.3703477	0.6916751	0.2728853	0.0822982	-0.6199823	-0.4041552	0.7022805	0.3357828	0.4949551	0.7853981	1.1817608
	0.7159646	0.3552429	0.3440231	2.1518822	2.4994431	0.8090830	0.5753814					
753	0.3693904	0.3693902	0.6908336	0.2718880	0.0819780	-0.6207446	-0.4045915	0.7027225	0.3359053	0.4949358	0.7853981	1.1807022
	0.7142255	0.3558558	0.3432124	2.1520653	2.5002499	0.8079547	0.5740322					
754	0.3684321	0.3684319	0.6899905	0.2708901	0.0816577	-0.6215091	-0.4050320	0.7031668	0.3360274	0.4949164	0.7853981	1.1796358
	0.7124946	0.3564599	0.3423991	2.1522503	2.5010586	0.8068256	0.5726821					
755	0.3674726	0.3674724	0.6891469	0.2698919	0.0813375	-0.6222683	-0.4054691	0.7036058	0.3361451	0.4948974	0.7853981	1.1785858
	0.7107408	0.3570658	0.3415839	2.1524383	2.5018711	0.8056957	0.5713302					
756	0.3665131	0.3665129	0.6883019	0.2688931	0.0810173	-0.6230295	-0.4059062	0.7040467	0.3362701	0.4948781	0.7853981	1.1775370
	0.7089566	0.3576816	0.3407659	2.1526261	2.5026855	0.8045652	0.5699783					
757	0.3655537	0.3655536	0.6874573	0.2678940	0.0806971	-0.6237897	-0.4063424	0.7044867	0.3363914	0.4948590	0.7853981	1.1764879
	0.7072532	0.3582948	0.3399454	2.1528120	2.5035019	0.8034355	0.5686268					
758	0.3645926	0.3645924	0.6866110	0.2668945	0.0803768	-0.6245478	-0.4067774	0.7049246	0.3365125	0.4948396	0.7853981	1.1754436
	0.7055066	0.3589092	0.3391225	2.1530008	2.5043221	0.8023047	0.5672727					
759	0.3636314	0.3636312	0.6857634	0.2658947	0.0800564	-0.6253052	-0.4072117	0.7053618	0.3366324	0.4948207	0.7853981	1.1744032
	0.7037585	0.3595245	0.3382976	2.1531916	2.5051441	0.8011730	0.5659186					
760	0.3626695	0.3626697	0.6849148	0.2648942	0.0797364	-0.6260679	-0.4076485	0.7058033	0.3367517	0.4948016	0.7853981	1.1733532
	0.7020105	0.3601415	0.3374700	2.1533833	2.5059471	0.8000407	0.5645643					
761	0.3617073	0.3617071	0.6840650	0.2638937	0.0794162	-0.6268184	-0.4080787	0.7062345	0.3368708	0.4947827	0.7853981	1.1723289
	0.7002600	0.3607550	0.3366405	2.1535759	2.5067949	0.7989079	0.5632079					
762	0.3607442	0.3607441	0.6832116	0.2628927	0.0790959	-0.6275790	-0.4085144	0.7066749	0.3369867	0.4947636	0.7853981	1.1712837
	0.6985082	0.3613771	0.3358095	2.1537704	2.5076218	0.7977720	0.5618513					
763	0.3597802	0.3597800	0.6823585	0.2618913	0.0787757	-0.6283293	-0.4089435	0.7071050	0.3371027	0.4947446	0.7853981	1.1702642
	0.6967545	0.3619967	0.3349756	2.1539661	2.5084543	0.7966368	0.5604932					
764	0.3588157	0.3588155	0.6815041	0.2608895	0.0784554	-0.6290872	-0.4093773	0.7075427	0.3372159	0.4947256	0.7853981	1.1692276
	0.6950302	0.3626176	0.3341393	2.1541615	2.5092969	0.7955018	0.5591345					
765	0.3578516	0.3578508	0.6806480	0.2598873	0.0781353	-0.6298411	-0.4098082	0.7079763	0.3373347	0.4947070	0.7853981	1.1682014
	0.6932445	0.3632353	0.3333010	2.1543589	2.5101223	0.7943638	0.5577756					
766	0.3568854	0.3568854	0.6797930	0.2588845	0.0778150	-0.6305959	-0.4102399	0.7084109	0.3374513	0.4946880	0.7853981	1.1671743
	0.6914390	0.3638636	0.3324509	2.1545582	2.5109615	0.7932280	0.5564157					
767	0.3559156	0.3559106	0.6789364	0.2578813	0.0774948	-0.6313487	-0.4106696	0.7088435	0.3375666	0.4946690	0.7853981	1.1661530
	0.6897303	0.3644880	0.3316148	2.1547585	2.5118027	0.7920912	0.5550553					
768	0.3549533	0.3549533	0.6780795	0.2568777	0.0771745	-0.6321024	-0.4111001	0.7092765	0.3376821	0.4946503	0.7853981	1.1651316
	0.6879714	0.3651158	0.3307678	2.1549597	2.5126467	0.7909545	0.5536942					
769	0.3539858	0.3539858	0.6772191	0.2558737	0.0768543	-0.6328553	-0.4115303	0.7097096	0.3377952	0.4946316	0.7853981	1.1641121
	0.6862101	0.3657429	0.3299192	2.1551619	2.5134926	0.7898149	0.5523314					
770	0.3530181	0.3530179	0.6763574	0.2548695	0.0765341	-0.6336121	-0.4119557	0.7101382	0.3379073	0.4946131	0.7853981	1.1631069
	0.6844472	0.3663708	0.3290687	2.1553659	2.5143423	0.7886747	0.5509682					
771	0.3520457	0.3520457	0.6754978	0.2538646	0.0762138	-0.6343518	-0.4123931	0.7105656	0.3380219	0.4945944	0.7853981	1.1620970
	0.6826841	0.3670018	0.3282138	2.1555719	2.5151949	0.7875368	0.5496045					
772	0.3510813	0.3510811	0.6746356	0.2528596	0.0758936	-0.6351027	-0.4128113	0.7109883	0.3381343	0.4945757	0.7853981	1.1610851
	0.6809201	0.3676331	0.3273575	2.1557779	2.5160484	0.7863970	0.5482402					
773	0.3501112	0.3501110	0.6737696	0.2518543	0.0755734	-0.6358538	-0.4132383	0.7114272	0.3382442	0.4945571	0.7853981	1.1600742
	0.6791531	0.3682646	0.3264995	2.1559859	2.5169039	0.7852538	0.5468739					
774	0.3491411	0.3491409	0.6729034	0.2508481	0.0752532	-0.6366042	-0.4136664	0.7118574	0.3383541	0.4945384	0.7853981	1.1590652
	0.6773855	0.3688977	0.3256387	2.1561956	2.5177622	0.7841111	0.5455076					
775	0.3481656	0.3481656	0.6720377	0.2498416	0.0749329	-0.6373473	-0.4140891	0.7122892	0.3384653	0.4945202	0.7853981	1.1580753
	0.6756154	0.3695331	0.3247745	2.1564064	2.5186272	0.7829692	0.5441357					
776	0.3471903	0.3471901	0.6711696	0.2488350	0.0746127	-0.6380969	-0.4145157	0.7127257	0.3385743	0.4945015	0.7853981	1.1570702
	0.6738451	0.3701686	0.3239086	2.1566172	2.5194893	0.7818255	0.5427715					
777	0.3462264	0.3462262	0.6702994	0.2478275	0.0742925	-0.6388485	-0.4149432	0.7131610	0.3386821	0.4944833	0.7853981	1.1560621
	0.6720746	0.3708056	0.3230400	2.1568308	2.5203543	0.7806802	0.5414021					
778	0.3452542	0.3452541	0.6694322	0.2468199	0.0739723	-0.6395921	-0.4153656	0.7135943	0.3387928	0.4944646	0.7853981	1.1550732
	0.6703026	0.3714455	0.3221675	2.1570444	2.5212250	0.7795383	0.5400338					
779	0.3442816	0.3442808	0.6685603	0.2458118	0.0736521	-0.6403374	-0.4157884	0.7139894	0.3388959	0.4944463	0.7853981	1.1540813
	0.6685278	0.3720851	0.3212936	2.1572609	2.5220976	0.7783924	0.5386631					
780	0.3433071	0.3433071	0.6676883	0.2448032	0.0733318	-0.6410836	-0.4162129	0.7144154	0.3389973	0.4944281	0.7853981	1.1530886
	0.6667528	0.3727266	0.3204166	2.1574783	2.5229721	0.7772468	0.5372921					
781	0.3423327	0.3423325	0.6668155	0.2437943	0.0730116	-0.6418256	-0.4166337	0.7148372	0.3391148	0.4944098	0.7853981	1.1520963
	0.6649754	0.3733693	0.3195379	2.1576967	2.5239514	0.7761009	0.5359195					
782	0.3413573	0.3413571	0.6659390	0.2427851	0.0726914	-0.6425703	-0.4170563	0.7152616	0.3392292	0.4943914	0.7853981	1.1511192
	0.6631963	0.3740129	0.3186559	2.1579170	2.5247337	0.7749521	0.5345463					
783	0.3403819	0.3403813	0.6650627	0.2417753	0.0723711	-0.6433141	-0.4174779	0.7156852	0.3393243	0.4943731	0.7853981	1.1501350
	0.6614176	0.3746568	0.3177715	2.1581373	2.5256129	0.7738038	0.5331723					

	0.6596341	0.3753024	0.3168847	2.1583614	2.5264997	0.7726540	0.5317964				
785	0.3384284	0.3384282	0.6633081	0.2397542	0.0717307	-0.6447985	-0.4183190	0.7169251	0.3395340	0.4943370	0.7853981	1.1481771
	0.6578537	0.3759513	0.3159935	2.1585846	2.5273876	0.7715068	0.5304219				
786	0.3374508	0.3374506	0.6624296	0.2387433	0.0714105	-0.6455361	-0.4187365	0.7169466	0.3396364	0.4943191	0.7853981	1.1472092
	0.6560690	0.3766004	0.3151006	2.1588116	2.5282812	0.7703579	0.5290453				
787	0.3364728	0.3364726	0.6615495	0.2377315	0.0710902	-0.6462906	-0.4191579	0.7173708	0.3397419	0.4943007	0.7853981	1.1462269
	0.6542851	0.3772511	0.3142046	2.1590376	2.5291739	0.7692080	0.5276685				
788	0.3354945	0.3354943	0.6606688	0.2367196	0.0707700	-0.6470177	-0.4195747	0.7177877	0.3398457	0.4942828	0.7853981	1.1452627
	0.6524986	0.3779031	0.3133060	2.1592674	2.5300722	0.7680579	0.5262909				
789	0.3345150	0.3345148	0.6597876	0.2357069	0.0704490	-0.6477570	-0.4199929	0.7182068	0.3399488	0.4942649	0.7853981	1.1442947
	0.6507106	0.3785571	0.3124039	2.1594973	2.5309734	0.7669079	0.5249118				
790	0.3335356	0.3335354	0.6589048	0.2346943	0.0701296	-0.6484997	-0.4204125	0.7186293	0.3400509	0.4942470	0.7853981	1.1433191
	0.6499230	0.3792115	0.3114099	2.1597281	2.5318747	0.7657568	0.5235331				
791	0.3325564	0.3325545	0.6580198	0.2336878	0.0698093	-0.6492331	-0.4208266	0.7190424	0.3401522	0.4942290	0.7853981	1.1423664
	0.6471316	0.3798674	0.3105929	2.1599617	2.5327826	0.7646042	0.5221519				
792	0.3315740	0.3315739	0.6571370	0.2326669	0.0694891	-0.6499760	-0.4212463	0.7194651	0.3402554	0.4942111	0.7853981	1.1413937
	0.6453413	0.3805261	0.3096818	2.1601954	2.5336914	0.7634543	0.5207714				
793	0.3305927	0.3305925	0.6562503	0.2316526	0.0691689	-0.6507135	-0.4216627	0.7198824	0.3403556	0.4941936	0.7853981	1.1404324
	0.6435481	0.3811843	0.3087690	2.1604328	2.5346031	0.7623007	0.5193909				
794	0.3296102	0.3296100	0.6553637	0.2306381	0.0688487	-0.6514452	-0.4220752	0.7202939	0.3404566	0.4941756	0.7853981	1.1394863
	0.6417536	0.3818451	0.3078532	2.1606773	2.5355196	0.7611480	0.5180067				
795	0.3286269	0.3286268	0.6544722	0.2296233	0.0685284	-0.6521838	-0.4224916	0.7207122	0.3405536	0.4941577	0.7853981	1.1385250
	0.6399576	0.3825053	0.3069357	2.1609257	2.5364351	0.7599912	0.5166227				
796	0.3276436	0.3276434	0.6535826	0.2286077	0.0682082	-0.6529175	-0.4229051	0.7211257	0.3406528	0.4941491	0.7853981	1.1375761
	0.6381605	0.3831660	0.3061144	2.1611595	2.5373564	0.7589368	0.5152383				
797	0.3266594	0.3266593	0.6526923	0.2275914	0.0678880	-0.6536527	-0.4233191	0.7215407	0.3407518	0.4941226	0.7853981	1.1366243
	0.6363618	0.3838228	0.3052895	2.1613941	2.5382805	0.7576820	0.5138531				
798	0.3256743	0.3256741	0.6517983	0.2265753	0.0675678	-0.6543881	-0.4237333	0.7219558	0.3408481	0.4941046	0.7853981	1.1356735
	0.6345620	0.3844970	0.3041633	2.1616373	2.5392056	0.7565243	0.5124663				
799	0.3246884	0.3246882	0.6509053	0.2255582	0.0672475	-0.6551183	-0.4241443	0.7223659	0.3409460	0.4940875	0.7853981	1.1347351
	0.6327592	0.3851443	0.3032327	2.1618834	2.5401373	0.7553680	0.5110785				
800	0.3237031	0.3237029	0.6500116	0.2245409	0.0669273	-0.6558539	-0.4245577	0.7227812	0.3410429	0.4940698	0.7853981	1.1337852
	0.6309582	0.3858328	0.3022993	2.1621314	2.5410691	0.7542117	0.5096917				
801	0.3227156	0.3227156	0.6491148	0.2235229	0.0666071	-0.6565834	-0.4249679	0.7231904	0.3411385	0.4940523	0.7853981	1.1328506
	0.6291531	0.3865021	0.3013632	2.1623802	2.5420055	0.7530528	0.5083022				
802	0.3217282	0.3217282	0.6482185	0.2225049	0.0662879	-0.6573166	-0.4253803	0.7236035	0.3412346	0.4940347	0.7853981	1.1319084
	0.6273475	0.3871731	0.3004241	2.1626311	2.5429440	0.7518950	0.5069123				
803	0.3207409	0.3207408	0.6473220	0.2214869	0.0659686	-0.6580498	-0.4257921	0.7240164	0.3413307	0.4940172	0.7853981	1.1309662
	0.6255420	0.3878462	0.2994812	2.1628828	2.5438862	0.7507375	0.5055225				
804	0.3197536	0.3197529	0.6464260	0.2204667	0.0656464	-0.6587774	-0.4262003	0.7244238	0.3414279	0.4939999	0.7853981	1.1300383
	0.6237351	0.3885215	0.2985345	2.1631365	2.5448332	0.7495810	0.5041322				
805	0.3187645	0.3187647	0.6455316	0.2194466	0.0653262	-0.6595370	-0.4266096	0.7248331	0.3415267	0.4939826	0.7853981	1.1291065
	0.6219270	0.3891959	0.2975833	2.1633930	2.5457850	0.7484265	0.5027416				
806	0.3177754	0.3177752	0.6446307	0.2184245	0.0650059	-0.6602394	-0.4270209	0.7252454	0.3416294	0.4939651	0.7853981	1.1281691
	0.6201165	0.3898766	0.2966317	2.1636515	2.5467358	0.7472665	0.5013489				
807	0.3167856	0.3167849	0.6437313	0.2174058	0.0646857	-0.6609478	-0.4274293	0.7256535	0.3417163	0.4939479	0.7853981	1.1272421
	0.6183151	0.3905560	0.2956758	2.1639090	2.5476913	0.7461083	0.4999552				
808	0.3157946	0.3157945	0.6428299	0.2163846	0.0643655	-0.6616959	-0.4278379	0.7260614	0.3418103	0.4939307	0.7853981	1.1263161
	0.6164930	0.3912364	0.2947170	2.1641693	2.5485498	0.7449488	0.4985616				
809	0.3148034	0.3148031	0.6419285	0.2153629	0.0640453	-0.6624247	-0.4282465	0.7264699	0.3419052	0.4939135	0.7853981	1.1253901
	0.6146782	0.3919161	0.2937545	2.1644335	2.5496130	0.7437899	0.4971664				
810	0.3138115	0.3138113	0.6410236	0.2143410	0.0637251	-0.6631514	-0.4286520	0.7268764	0.3419972	0.4938962	0.7853981	1.1244688
	0.6128632	0.3926017	0.2927903	2.1646967	2.5505772	0.7426282	0.4957708				
811	0.3128181	0.3128179	0.6401156	0.2133185	0.0634048	-0.6638767	-0.4290580	0.7272815	0.3420873	0.4938784	0.7853981	1.1235523
	0.6110436	0.3932849	0.2918234	2.1649647	2.5515451	0.7414641	0.4943731				
812	0.3118245	0.3118247	0.6392090	0.2122957	0.0630846	-0.6646013	-0.4294624	0.7276859	0.3421788	0.4938622	0.7853981	1.1226377
	0.6092256	0.3939704	0.2908526	2.1652327	2.5525163	0.7403019	0.4929755				
813	0.3107961	0.3107959	0.6382995	0.2112727	0.0627643	-0.6651630	-0.4297725	0.7279264	0.3422914	0.4938447	0.7853981	1.1220942
	0.6073417	0.3946469	0.2898788	2.1655121	2.5535593	0.7391374	0.4915781				
814	0.3098006	0.3098004	0.6373906	0.2102484	0.0624442	-0.6658790	-0.4301739	0.7283231	0.3423825	0.4938278	0.7853981	1.1211987
	0.6055185	0.3953356	0.2889015	2.1657839	2.5546307	0.7379741	0.4901277					
815	0.3088053	0.3088051	0.6364832	0.2092241	0.0621235	-0.6665871	-0.4305801	0.7287310	0.3424721	0.4938106	0.7853981	1.1202784
	0.6036966	0.3960248	0.2879209	2.1660576	2.5555201	0.7368100	0.4887269					
816	0.3078094	0.3078092	0.6355708	0.2081992	0.0618037	-0.6673254	-0.4309809	0.7291251	0.3425633	0.4937937	0.7853981	1.1193810
	0.6018714	0.3967169	0.2869360	2.1663342	2.5565071	0.7356473	0.4873258					
817	0.3068129	0.3068127	0.6346592	0.2071738	0.0614834	-0.6680500	-0.4313853	0.7295334	0.3426530	0.4937769	0.7853981	1.1184702
	0.6000457	0.3974101	0.2859483	2.1665117	2.5574951	0.7344832	0.4859238					
818	0.3058156	0.3058155	0.6337457	0.2061481	0.0611632	-0.6687717	-0.4317877	0.7299349	0.3427414	0.4937600	0.7853981	1.1175671
	0.5982187	0.3981041	0.2849578	2.1668911	2.5584869	0.7333178	0.4845209					
819	0.3048177	0.3048176	0.6328327	0.2051216	0.0608431	-0.6694911	-0.4321887	0.7303340	0.3428300	0.4937431	0.7853981	1.1166697
	0.5963901	0.3988007	0.2839628	2.1671724	2.5594815	0.7321534	0.4831117					

820	0.3038198	0.3038197	0.6319195	0.2040948	0.0605228	-0.6702150	-0.4325925	0.7307378	0.3429204	0.4937266	0.7853981	1.1157627
	0.5945611	0.3994588	0.2829645	2.1674557	2.5604820	0.7399895	0.4817132					
821	0.3028211	0.3028209	0.6319923	0.2030675	0.0602025	-0.6709358	-0.4329949	0.7311383	0.3430066	0.4937098	0.7853981	1.1148643
	0.5927305	0.4001973	0.2819638	2.1677418	2.5614834	0.7298223	0.4803083					
822	0.3018210	0.3018208	0.6300851	0.2020398	0.0598823	-0.6716531	-0.4333931	0.7315354	0.3430541	0.4936929	0.7853981	1.1139746
	0.5908975	0.4008576	0.2809592	2.1680289	2.5624895	0.7296557	0.4789015					
823	0.3008207	0.3008205	0.6291678	0.2010114	0.0595621	-0.6723738	-0.4337944	0.7319359	0.3431417	0.4936764	0.7853981	1.1130772
	0.5898632	0.4016100	0.2799507	2.1683187	2.5634995	0.7274997	0.4774944					
824	0.2998196	0.2998195	0.6282462	0.1999830	0.0592419	-0.6730901	-0.4341924	0.7323320	0.3432657	0.4936599	0.7853981	1.1121902
	0.5888275	0.4023020	0.2789404	2.1686096	2.5645113	0.7263201	0.4760863					
825	0.2988173	0.2988172	0.6273229	0.1989535	0.0589216	-0.6738196	-0.4345926	0.7327312	0.3433881	0.4936433	0.7853981	1.1112976
	0.5877895	0.4030048	0.2779271	2.1688943	2.5655260	0.7251487	0.4746765					
826	0.2978151	0.2978149	0.6263998	0.1979243	0.0586014	-0.6745285	-0.4349923	0.7331300	0.3434926	0.4936265	0.7853981	1.1104069
	0.5867514	0.4037106	0.2769091	2.1691599	2.5665445	0.7239757	0.4732669					
827	0.2968116	0.2968116	0.6254754	0.1969542	0.0582812	-0.6752441	-0.4353855	0.7335253	0.3435159	0.4936104	0.7853981	1.1095247
	0.5857110	0.4044174	0.2758877	2.1694584	2.5675678	0.7228093	0.4718559					
828	0.2958078	0.2958077	0.6245502	0.1958636	0.0579610	-0.6759595	-0.4357867	0.7339205	0.3435950	0.4935939	0.7853981	1.1086435
	0.5846656	0.4051256	0.2748629	2.1697979	2.5685749	0.7216388	0.4704443					
829	0.2948037	0.2948035	0.6236243	0.1948325	0.0576407	-0.6766746	-0.4361834	0.7343153	0.3436817	0.4935774	0.7853981	1.1077633
	0.5836222	0.4058356	0.2738343	2.1701002	2.5696249	0.7204681	0.4690319					
830	0.2937984	0.2937983	0.6226955	0.1938011	0.0573205	-0.6773891	-0.4365796	0.7347096	0.3437628	0.4935612	0.7853981	1.1068859
	0.5825822	0.4065463	0.2728028	2.1704054	2.5706597	0.7192957	0.4676181					
831	0.2927917	0.2927917	0.6217657	0.1927690	0.0570003	-0.6781011	-0.4369742	0.7351013	0.3438435	0.4935447	0.7853981	1.1060152
	0.5743351	0.4072582	0.2717677	2.1707125	2.5716963	0.7181223	0.4662026					
832	0.2917850	0.2917850	0.6209361	0.1917365	0.0566801	-0.6788196	-0.4373725	0.7354957	0.3439242	0.4935286	0.7853981	1.1051292
	0.5724850	0.4079723	0.2707286	2.1710205	2.5727353	0.7169519	0.4647887					
833	0.2907789	0.2907789	0.6199075	0.1907032	0.0563598	-0.6795337	-0.4377683	0.7358935	0.3440067	0.4935124	0.7853981	1.1042547
	0.5706407	0.4086894	0.2696844	2.1713314	2.5737820	0.7157793	0.4633722					
834	0.2897714	0.2897710	0.6189745	0.1896698	0.0560396	-0.6802443	-0.4381615	0.7362839	0.3440862	0.4934963	0.7853981	1.1033808
	0.5687904	0.4094057	0.2686384	2.1716452	2.5749310	0.7146055	0.4619551					
835	0.2887625	0.2887623	0.6180392	0.1886358	0.0557194	-0.6809564	-0.4385552	0.7366757	0.3441623	0.4934801	0.7853981	1.1025200
	0.5669385	0.4101231	0.2675891	2.1719608	2.5758820	0.7134293	0.4605368					
836	0.2877536	0.2877535	0.6171064	0.1876014	0.0553992	-0.6816686	-0.4389492	0.7370678	0.3442435	0.4934640	0.7853981	1.1016521
	0.5650861	0.4108425	0.2665347	2.1722784	2.5769386	0.7122566	0.4591184					
837	0.2867435	0.2867433	0.6161702	0.1865662	0.0550789	-0.6823784	-0.4393416	0.7374573	0.3443215	0.4934478	0.7853981	1.1007900
	0.5632310	0.4115646	0.2654771	2.1725988	2.5779991	0.7110812	0.4576981					
838	0.2857331	0.2857329	0.6152338	0.1855318	0.0547587	-0.6830903	-0.4397352	0.7378490	0.3443995	0.4934317	0.7853981	1.0999241
	0.5613755	0.4122874	0.2644157	2.1729212	2.5790625	0.7099061	0.4562776					
839	0.2847222	0.2847221	0.6142976	0.1844966	0.0544385	-0.6837962	-0.4401246	0.7382346	0.3444785	0.4934159	0.7853981	1.0990725
	0.5595182	0.4130124	0.2633496	2.1732473	2.5801315	0.7087323	0.4548565					
840	0.2837111	0.2837110	0.6133578	0.1834582	0.0541183	-0.6845000	-0.4405182	0.7386273	0.3445541	0.4934000	0.7853981	1.0982056
	0.5576606	0.4137377	0.2622812	2.1735744	2.5812016	0.7075555	0.4534352					
841	0.2826982	0.2826980	0.6124160	0.1824212	0.0537980	-0.6852105	-0.4409194	0.7390175	0.3446292	0.4933839	0.7853981	1.0973454
	0.5558001	0.4144638	0.2612091	2.1739035	2.5822754	0.7063774	0.4520112					
842	0.2816846	0.2816845	0.6114740	0.1813838	0.0534778	-0.6859226	-0.4413981	0.7394004	0.3447044	0.4933681	0.7853981	1.0965023
	0.5539371	0.4151918	0.2601329	2.1742373	2.5833559	0.7051998	0.4505865					
843	0.2806709	0.2806703	0.6105297	0.1803458	0.0531576	-0.6866346	-0.4416907	0.7397922	0.3447784	0.4933524	0.7853981	1.0956392
	0.5520731	0.4159208	0.2590531	2.1745710	2.5844374	0.7040207	0.4491417					
844	0.2796558	0.2796557	0.6095825	0.1793076	0.0528374	-0.6873434	-0.4420812	0.7401807	0.3448496	0.4933366	0.7853981	1.0947847
	0.5502085	0.4166501	0.2579706	2.1749086	2.5855217	0.7028396	0.4477349					
845	0.2786400	0.2786399	0.6086351	0.1782683	0.0525171	-0.6880451	-0.4424675	0.7405623	0.3449239	0.4933208	0.7853981	1.0939465
	0.5483415	0.4173827	0.2568821	2.1752491	2.5865146	0.7016608	0.4463071					
846	0.2776258	0.2776248	0.6076923	0.1772290	0.0521969	-0.6887553	-0.4428585	0.7409523	0.3449982	0.4933049	0.7853981	1.0930901
	0.5464755	0.4181173	0.2557897	2.1755905	2.5877085	0.7004834	0.4448805					
847	0.2766075	0.2766078	0.6067441	0.1761897	0.0518767	-0.6894563	-0.4432443	0.7413339	0.3450707	0.4932895	0.7853981	1.0922546
	0.5446055	0.4188526	0.2546936	2.1759347	2.5888000	0.6993032	0.4434512					
848	0.2755907	0.2755905	0.6057944	0.1751494	0.0515565	-0.6901635	-0.4436328	0.7417200	0.3451421	0.4932736	0.7853981	1.0914068
	0.5427356	0.4195866	0.2535943	2.1762829	2.5899135	0.6981225	0.4420215					
849	0.2745724	0.2745723	0.6048439	0.1741071	0.0512362	-0.6908658	-0.4440187	0.7421020	0.3452137	0.4932583	0.7853981	1.0905695
	0.5408627	0.4203267	0.2524902	2.1766338	2.5910177	0.6969416	0.4405906					
850	0.2735542	0.2735541	0.6038931	0.1730658	0.0509160	-0.6915703	-0.4444059	0.7424864	0.3452848	0.4932428	0.7853981	1.0897284
	0.5389898	0.4210662	0.2513823	2.1769876	2.5921288	0.6957612	0.4391590					
851	0.2725346	0.2725344	0.6029398	0.1720236	0.0505958	-0.6922717	-0.4447923	0.7428675	0.3453549	0.4932274	0.7853981	1.0888948
	0.5371140	0.4218068	0.2502734	2.1773424	2.5932446	0.6945791	0.4377270					
852	0.2715151	0.2715150	0.6019885	0.1709813	0.0502756	-0.6929736	-0.4451763	0.7432491	0.3454268	0.4932119	0.7853981	1.0880613
	0.5352384	0.4225501	0.2491534	2.1777020	2.5943651	0.6933905	0.4362945					
853	0.2704942	0.2704942	0.6010332	0.1699378	0.0499553	-0.6936786	-0.4455633	0.7436339	0.3454980	0.4931964	0.7853981	1.0872211
	0.5333606	0.4232937	0.2480332	2.1780624	2.5954876	0.6922173	0.4348603					
854	0.2694725	0.2694724	0.6001761	0.1688942	0.0496351	-0.6943769	-0.4459459	0.7440121	0.3455643	0.4931810	0.7853981	1.0863562
	0.5314806	0.4240392	0.2469093	2.1784267	2.5966158	0.6910334	0.4334247					
855	0.2684502	0.2684502	0.5991178	0.1678511	0.0493142	-0.6950794	-0.4463313	0.7443942	0.3456317	0.4931655	0.7853981	1.0855637
	0.5295998	0.4247841	0.2457811	2.1787930	2.5977468	0.6898494	0.4319884					

857	0.2664044	0.2664040	0.5971983	0.1657603	0.0486744	-0.6964831	-0.4470999	0.7451575	0.3457657	0.4931354	0.7853981	1.0839024
	0.5258332	0.4262805	0.2435120	2.1795359	2.6000223	0.6874809	0.4291147					
858	0.2653758	0.2653757	0.5962371	0.1647146	0.0483542	-0.6971796	-0.4474810	0.7455338	0.3458322	0.4931195	0.7853981	1.0830841
	0.5239481	0.4270308	0.2423711	2.1799107	2.6011677	0.6862964	0.4276751					
859	0.2643546	0.2643545	0.5952751	0.1636682	0.0480340	-0.6978778	-0.4478627	0.7455117	0.3458989	0.4931049	0.7853981	1.0822639
	0.5220606	0.4277630	0.2412253	2.1802893	2.6023169	0.6851118	0.4262351					
860	0.2633291	0.2633290	0.5943118	0.1626216	0.0477138	-0.6985732	-0.4482427	0.7462869	0.3459646	0.4930897	0.7853981	1.0814486
	0.5201718	0.4285361	0.2400758	2.1806717	2.6034718	0.6939268	0.4247945					
861	0.2623129	0.2623128	0.5933448	0.1615742	0.0473935	-0.6992761	-0.4486273	0.7466656	0.3460213	0.4930747	0.7853981	1.0806189
	0.5182823	0.4292897	0.2389226	2.1810560	2.6046267	0.6927390	0.4233533					
862	0.2612759	0.2612758	0.5923812	0.1605265	0.0471733	-0.6999713	-0.4490111	0.7470446	0.3460541	0.4930595	0.7853981	1.0798063
	0.5163907	0.4300464	0.2377634	2.1814432	2.6057911	0.6915553	0.4219108					
863	0.2602231	0.2602230	0.5914131	0.1594780	0.0467530	-0.7006431	-0.4493159	0.7472562	0.3461738	0.4930444	0.7853981	1.0792618
	0.5144515	0.4307934	0.2366005	2.1818428	2.6070395	0.6903679	0.4204323					
864	0.2592192	0.2592191	0.5904452	0.1584292	0.0466329	-0.7013595	-0.4497648	0.7477928	0.3462213	0.4930300	0.7853981	1.0781870
	0.5126024	0.4315616	0.2354338	2.1822271	2.6081295	0.6891815	0.4189224					
865	0.2581646	0.2581647	0.5894743	0.1573757	0.0461126	-0.7019371	-0.4502739	0.7480447	0.3462998	0.4930146	0.7853981	1.0776424
	0.5106595	0.4323111	0.2342626	2.1826344	2.6093578	0.6879932	0.4175418					
866	0.2571342	0.2571342	0.5885012	0.1563300	0.0457924	-0.7026250	-0.4504514	0.7484174	0.3463603	0.4929999	0.7853981	1.0768375
	0.5087614	0.4330707	0.2330977	2.1830339	2.6105375	0.6868034	0.4160947					
867	0.2561032	0.2561032	0.5875283	0.1552794	0.0454721	-0.7032180	-0.4508289	0.7487501	0.3464215	0.4929848	0.7853981	1.0760326
	0.5068616	0.4338328	0.2319074	2.1834393	2.6117229	0.6856147	0.4146471					
868	0.2550721	0.2550719	0.5865538	0.1542286	0.0451519	-0.7040109	-0.4512064	0.7491629	0.3464816	0.4929703	0.7853981	1.0752287
	0.5049608	0.4345958	0.2307230	2.1838446	2.6129122	0.6844252	0.4131991					
869	0.2540395	0.2540398	0.5855781	0.1531769	0.0448317	-0.7047033	-0.4515833	0.7495350	0.3465413	0.4929556	0.7853981	1.0744267
	0.5030585	0.4353604	0.2295337	2.1842546	2.6141062	0.6832354	0.4117507					
870	0.2530066	0.2530067	0.5846008	0.1521249	0.0445115	-0.7053955	-0.4519603	0.7499370	0.3466001	0.4929408	0.7853981	1.0736256
	0.5011545	0.4361256	0.2283404	2.1846676	2.6153043	0.6820448	0.4102997					
871	0.2519732	0.2519732	0.5836244	0.1510722	0.0441912	-0.7060899	-0.4523380	0.7502811	0.3466604	0.4929262	0.7853981	1.0728207
	0.4992493	0.4368535	0.2271413	2.1850843	2.6165075	0.6808558	0.4088488					
872	0.2509391	0.2509390	0.5826451	0.1500192	0.0438710	-0.7067809	-0.4527135	0.7506519	0.3467183	0.4929118	0.7853981	1.0720234
	0.4973422	0.4376616	0.2259386	2.1855049	2.6177149	0.6796650	0.4073969					
873	0.2499045	0.2499043	0.5816678	0.1489652	0.0435508	-0.7074722	-0.4530894	0.7510230	0.3467789	0.4928970	0.7853981	1.0712261
	0.4954346	0.4384327	0.2247295	2.1859283	2.6189289	0.6784771	0.4059446					
874	0.2488681	0.2488680	0.5806840	0.1479112	0.0432306	-0.7081602	-0.4534631	0.7513908	0.3468342	0.4928826	0.7853981	1.0704365
	0.4935238	0.4392022	0.2235182	2.1863546	2.6201458	0.6772835	0.4044899					
875	0.2478316	0.2478317	0.5797023	0.1468562	0.0429103	-0.7088504	-0.4538377	0.7517608	0.3468919	0.4928682	0.7853981	1.0696430
	0.4916124	0.4399750	0.2223005	2.1867857	2.6213684	0.6760929	0.4030355					
876	0.2467946	0.2467946	0.5787198	0.1458009	0.0425901	-0.7095385	-0.4542113	0.7521287	0.3469495	0.4928539	0.7853981	1.0688543
	0.4896956	0.4407488	0.2210781	2.1872196	2.6225958	0.6749124	0.4015800					
877	0.2457566	0.2457565	0.5777324	0.1447451	0.0422699	-0.7102293	-0.4545856	0.7524992	0.3470032	0.4928395	0.7853981	1.0680609
	0.4877847	0.4415225	0.2198522	2.1876574	2.6238261	0.6737080	0.4001231					
878	0.2447188	0.2447188	0.5767469	0.1436887	0.0419497	-0.7109141	-0.4549569	0.7528638	0.3470552	0.4928251	0.7853981	1.0672808
	0.4858686	0.4422984	0.2186295	2.1881089	2.6250639	0.6725164	0.3986655					
879	0.2436786	0.2436785	0.5757589	0.1426216	0.0416294	-0.7115950	-0.4553213	0.7532344	0.3471134	0.4928107	0.7853981	1.0664883
	0.4839505	0.4430753	0.2173942	2.1885443	2.6263046	0.6713231	0.3972070					
880	0.2426385	0.2426384	0.5747713	0.1415741	0.0413092	-0.7122690	-0.4556714	0.7535982	0.3471687	0.4927966	0.7853981	1.0657110
	0.4820316	0.4438538	0.2161425	2.1889935	2.6275539	0.6701313	0.3957477					
881	0.2415976	0.2415975	0.5737817	0.1405159	0.0409892	-0.7129368	-0.4560141	0.7539657	0.3472229	0.4927822	0.7853981	1.0649261
	0.4801111	0.4446334	0.2148960	2.1894455	2.6288042	0.6689382	0.3942871					
882	0.2405560	0.2405559	0.5727903	0.1394573	0.0406688	-0.7136001	-0.4564439	0.7543288	0.3472759	0.4927682	0.7853981	1.0641518
	0.4781886	0.4454135	0.2136459	2.1899023	2.6300611	0.6677443	0.3928259					
882	0.2395138	0.2395137	0.5717978	0.1383980	0.0403485	-0.7143472	-0.4568155	0.7546957	0.3473284	0.4927541	0.7853981	1.0633698
	0.4762648	0.4461952	0.2123885	2.1903629	2.6313229	0.6665504	0.3913637					
884	0.2384711	0.2384710	0.5708056	0.1373382	0.0400283	-0.7150322	-0.4571861	0.7550606	0.3473817	0.4927402	0.7853981	1.0625925
	0.4743395	0.4469786	0.2111272	2.1908274	2.6325903	0.6653576	0.3899013					
885	0.2374275	0.2374274	0.5698112	0.1362778	0.0397081	-0.7157132	-0.4575565	0.7554262	0.3474336	0.4927260	0.7853981	1.0618143
	0.4724133	0.4477627	0.2098607	2.1912956	2.6338615	0.6641636	0.3884371					
886	0.2363838	0.2363839	0.5688148	0.1352170	0.0393879	-0.7164063	-0.4579252	0.7557882	0.3474844	0.4927120	0.7853981	1.0610447
	0.4704851	0.4485472	0.2085897	2.1917677	2.6351305	0.6629686	0.3869721					
887	0.2353374	0.2353373	0.5678172	0.1341555	0.0390676	-0.7170932	-0.4582935	0.7561508	0.3475348	0.4926983	0.7853981	1.0602741
	0.4685541	0.4493331	0.2073133	2.1922445	2.6363212	0.6617733	0.3855056					
888	0.2342914	0.2342913	0.5668176	0.1330935	0.0387474	-0.7177640	-0.4586628	0.7565114	0.3475841	0.4926846	0.7853981	1.0595083
	0.4666219	0.4501196	0.2061322	2.1927261	2.6375087	0.6605771	0.3840389					
889	0.2332444	0.2332443	0.5658158	0.1320316	0.0384272	-0.7184492	-0.4590305	0.7568763	0.3476318	0.4926706	0.7853981	1.0587329
	0.4646886	0.4509069	0.2047461	2.1932106	2.6386999	0.6593796	0.3825703					
890	0.2321965	0.2321967	0.5648130	0.1309690	0.0381070	-0.7191314	-0.4593983	0.7572384	0.3476790	0.4926568	0.7853981	1.0579672
	0.4627536	0.4516950	0.2033549	2.1936998	2.6402969	0.6581822	0.3811014					
891	0.2311462	0.2311461	0.5638094	0.1299042	0.0377867	-0.7198114	-0.4597647	0.7575981	0.3477265	0.4926431	0.7853981	1.0572042
	0.4608166	0.4524845	0.2021581	2.1941935	2.6415057	0.6569849	0.3796309					

892	0.2300988	0.2300587	0.5628032	0.1288401	0.0374665	-0.7204908	-0.4601306	0.7579573	0.3477721	0.4926295	0.7853981	1.0564442
	0.4588775	0.4532742	0.2008567	2.1966917	2.6429081	0.6457860	0.3781595					
893	0.2290496	0.2290469	0.5617974	0.1277751	0.0371463	-0.7211716	-0.4604968	0.7583178	0.3478187	0.4926158	0.7853981	1.0556822
	0.4569378	0.4540660	0.1995491	2.1951942	2.6442213	0.6445895	0.3766878					
894	0.2279987	0.2279986	0.5607924	0.1267008	0.0368261	-0.7218509	-0.4608626	0.7586770	0.3478663	0.4926021	0.7853981	1.0549221
	0.4549076	0.4548592	0.1982357	2.1936597	2.6455412	0.6433928	0.3752154					
895	0.2269475	0.2269474	0.5597879	0.1256436	0.0365058	-0.7225269	-0.4612263	0.7590327	0.3479153	0.4925887	0.7853981	1.0541716
	0.4530546	0.4556542	0.1969160	2.1921109	2.6468687	0.6421986	0.3737418					
896	0.2258966	0.2258959	0.5587779	0.1245771	0.0361856	-0.7232098	-0.4615934	0.7593954	0.3479594	0.4925750	0.7853981	1.0534058
	0.4511113	0.4564484	0.1955928	2.1907268	2.6481972	0.6410000	0.3722678					
897	0.2248430	0.2248428	0.5577670	0.1235099	0.0358654	-0.7238945	-0.4619555	0.7597498	0.3480039	0.4925617	0.7853981	1.0526591
	0.4491648	0.4572435	0.1942636	2.1892475	2.6495333	0.6398016	0.3707919					
898	0.2237855	0.2237851	0.5567555	0.1224420	0.0355451	-0.7245618	-0.4623192	0.7601069	0.3480484	0.4925483	0.7853981	1.0519056
	0.4472168	0.4580359	0.1929286	2.1877330	2.6508751	0.6386034	0.3693151					
899	0.2227356	0.2227355	0.5557443	0.1213738	0.0352249	-0.7252411	-0.4626841	0.7604660	0.3480933	0.4925347	0.7853981	1.0511494
	0.4452652	0.4588376	0.1915879	2.1863023	2.6522217	0.6374069	0.3678386					
900	0.2216865	0.2216864	0.5547332	0.1203047	0.0349047	-0.7259153	-0.4630456	0.7608199	0.3481392	0.4925216	0.7853981	1.0504045
	0.4433188	0.4596367	0.1902410	2.1848373	2.6535759	0.6362112	0.3663607					
901	0.2206245	0.2206247	0.5537164	0.1192354	0.0345845	-0.7265916	-0.4634084	0.7611760	0.3481806	0.4925083	0.7853981	1.0496559
	0.4413661	0.4604346	0.1888902	2.1833771	2.6549339	0.6350111	0.3648809					
902	0.2195682	0.2195681	0.5526981	0.1181653	0.0342642	-0.7272673	-0.4637735	0.7615315	0.3482212	0.4924950	0.7853981	1.0489092
	0.4394121	0.4612333	0.1875336	2.1819216	2.6562947	0.6338106	0.3634004					
903	0.2184917	0.2184916	0.5516787	0.1170948	0.0339440	-0.7279430	-0.4640797	0.7618930	0.3482741	0.4924816	0.7853981	1.0483599
	0.4374213	0.4620225	0.1861714	2.1804805	2.6577072	0.6326101	0.3618922					
904	0.2174340	0.2174339	0.5506626	0.1160234	0.0336238	-0.7286225	-0.4644406	0.7621463	0.3483179	0.4924686	0.7853981	1.0476189
	0.4354647	0.4628246	0.1848017	2.1790355	2.6590843	0.6314138	0.3604105					
905	0.2163745	0.2163748	0.5496617	0.1149517	0.0333036	-0.7291948	-0.4648004	0.7624984	0.3483580	0.4924552	0.7853981	1.0468807
	0.4335063	0.4636253	0.1834279	2.1775944	2.6604652	0.6302140	0.3589271					
906	0.2153156	0.2153155	0.5486618	0.1138791	0.0329833	-0.7298668	-0.4651597	0.7628501	0.3483995	0.4924423	0.7853981	1.0461435
	0.4315462	0.4644261	0.1820471	2.1761595	2.6618538	0.6290162	0.3574433					
907	0.2142552	0.2142550	0.5475972	0.1128063	0.0326631	-0.7305414	-0.4655208	0.7632045	0.3484375	0.4924293	0.7853981	1.0454016
	0.4295842	0.4652259	0.1806619	2.1747302	2.6632462	0.6278148	0.3559581					
908	0.2131940	0.2131938	0.5465734	0.1117326	0.0323429	-0.7312130	-0.4658798	0.7635559	0.3484769	0.4924163	0.7853981	1.0446672
	0.4276206	0.4660332	0.1792699	2.1733062	2.6646452	0.6266154	0.3544729					
909	0.2121315	0.2121318	0.5455472	0.1106585	0.0320227	-0.7318847	-0.4662389	0.7639073	0.3485149	0.4924036	0.7853981	1.0439320
	0.4256545	0.4668363	0.1778726	2.1718876	2.6660509	0.6254148	0.3529848					
910	0.2110694	0.2110693	0.5445214	0.1095836	0.0317024	-0.7325573	-0.4665979	0.7642597	0.3485525	0.4923906	0.7853981	1.0431957
	0.4236850	0.4676429	0.1764686	2.1704735	2.6674614	0.6242155	0.3514971					
911	0.2100068	0.2100062	0.5434940	0.1085093	0.0313822	-0.7332280	-0.4669561	0.7646102	0.3485911	0.4923779	0.7853981	1.0424643
	0.4217112	0.4684446	0.1750590	2.1689657	2.6688786	0.6230159	0.3500082					
912	0.2089422	0.2089421	0.5424648	0.1074323	0.0310619	-0.7338962	-0.4673126	0.7649581	0.3486280	0.4923649	0.7853981	1.0417385
	0.4197513	0.4692507	0.1736432	2.1674646	2.6703024	0.6218157	0.3485150					
913	0.2078772	0.2078770	0.5414343	0.1063558	0.0307418	-0.7345654	-0.4676692	0.7653071	0.3486645	0.4923522	0.7853981	1.0410109
	0.4177880	0.4700559	0.1722217	2.1659674	2.6717319	0.6206153	0.3470281					
914	0.2068111	0.2068110	0.5404018	0.1052786	0.0304215	-0.7352325	-0.4680247	0.7656540	0.3486998	0.4923397	0.7853981	1.0402889
	0.4158061	0.4708612	0.1707940	2.1644777	2.6731682	0.6194142	0.3455359					
915	0.2057451	0.2057450	0.5393699	0.1042009	0.0301013	-0.7359043	-0.4683830	0.7660056	0.3487357	0.4923270	0.7853981	1.0395565
	0.4138324	0.4716677	0.1693597	2.1629528	2.6746092	0.6182147	0.3440441					
916	0.2046772	0.2046770	0.5383335	0.1031235	0.0297813	-0.7365708	-0.4687377	0.7663518	0.3487689	0.4923147	0.7853981	1.0388365
	0.4118547	0.4724731	0.1679201	2.1614146	2.6760578	0.6170120	0.3425496					
917	0.2036091	0.2036090	0.5372983	0.1020436	0.0294608	-0.7372373	-0.4690927	0.7666982	0.3488036	0.4923020	0.7853981	1.0381165
	0.4098765	0.4732755	0.1664737	2.1598421	2.6775122	0.6158116	0.3410550					
918	0.2025403	0.2025402	0.5362610	0.1009640	0.0291406	-0.7379047	-0.4694474	0.7670453	0.3488369	0.4922894	0.7853981	1.0373955
	0.4078978	0.4740762	0.1650210	2.1582744	2.6789722	0.6146106	0.3395595					
919	0.2014703	0.2014702	0.5352213	0.0998839	0.0288204	-0.7385723	-0.4698024	0.7673927	0.3488688	0.4922771	0.7853981	1.0366745
	0.4059157	0.4748721	0.1635526	2.1567153	2.6804399	0.6134091	0.3380636					
920	0.2003996	0.2003995	0.5341805	0.0988030	0.0285001	-0.7392389	-0.4701564	0.7677381	0.3489004	0.4922647	0.7853981	1.0359583
	0.4039328	0.4756685	0.1620975	2.1551619	2.6819124	0.6122058	0.3365647					
921	0.1993284	0.1993282	0.5331398	0.0977218	0.0281799	-0.7399045	-0.4705104	0.7680845	0.3489314	0.4922525	0.7853981	1.0352402
	0.4019475	0.4764649	0.1606261	2.1536152	2.6833916	0.6110039	0.3350664					
922	0.1982564	0.1982563	0.5320965	0.0966396	0.0278597	-0.7405691	-0.4708633	0.7684288	0.3489633	0.4922402	0.7853981	1.0345278
	0.3999614	0.4772520	0.1591476	2.1519741	2.6848293	0.6098032	0.3335671					
923	0.1971837	0.1971836	0.5310546	0.0955571	0.0275395	-0.7412336	-0.4712163	0.7687731	0.3489953	0.4922279	0.7853981	1.0338144
	0.3979742	0.4780350	0.1576628	2.1503385	2.6863718	0.6086031	0.3320671					
924	0.1961105	0.1961104	0.5300109	0.0944737	0.0272192	-0.7418974	-0.4715683	0.7691166	0.3490263	0.4922159	0.7853981	1.0331039
	0.3959853	0.4788161	0.1561712	2.1487112	2.6879719	0.6074029	0.3305662					
925	0.1950362	0.1950362	0.5289654	0.0933888	0.0268990	-0.7425628	-0.4719211	0.7694618	0.3490567	0.4922036	0.7853981	1.0323915
	0.3939934	0.4795926	0.1546735	2.1470922	2.6893778	0.6062022	0.3290643					
926	0.1939607	0.1939607	0.5279175	0.0923054	0.0265788	-0.7432263	-0.4722731	0.7698051	0.3490860	0.4921913	0.7853981	1.0316820
	0.3920115	0.4803689	0.1531689	2.1454759	2.6909903	0.6050008	0.3275607					
927	0.1928845	0.1928844	0.5268678	0.0912215	0.0262586	-0.7438844	-0.4726214	0.7701431	0.3491136	0.4921794	0.7853981	1.0309849
	0.3900365	0.4811429	0.1516584	2.1438742	2.6924114	0.6037982	0.3260561					

928	0.1918075	0.1918077	0.5258177	0.0901347	0.0259383	-0.7445695	-0.4729738	0.7704878	0.3491418	0.4921674	0.7853981	1.0302734
	0.3880106	0.4821496	0.1501405	2.2140702	2.6939373	0.6025968	0.3245513					
929	0.1917304	0.1907303	0.5247663	0.0899484	0.0256181	-0.7452113	-0.4733241	0.7708294	0.3491691	0.4921554	0.7853981	1.0295696
	0.3860132	0.4829546	0.1486161	2.2167778	2.6954699	0.6013955	0.3230454					
930	0.1896521	0.1896520	0.5237145	0.0879614	0.0252979	-0.7458733	-0.4736744	0.7711712	0.3491971	0.4921435	0.7853981	1.0288658
	0.3840144	0.4837596	0.1472844	2.2174921	2.6970100	0.6001951	0.3215386					
931	0.1885725	0.1885720	0.5226607	0.0868739	0.0249777	-0.7465304	-0.4740218	0.7715081	0.3492239	0.4921318	0.7853981	1.0281725
	0.3820125	0.4845636	0.1455463	2.2182150	2.6985588	0.5989939	0.3200306					
932	0.1874930	0.1874928	0.5216060	0.0857856	0.0246574	-0.7471938	-0.4743725	0.7718512	0.3492503	0.4921198	0.7853981	1.0274868
	0.3800105	0.4853674	0.1440009	2.2189445	2.7001123	0.5977932	0.3185218					
933	0.1864128	0.1864124	0.5205485	0.0846969	0.0243372	-0.7478551	-0.4747222	0.7721923	0.3492752	0.4921082	0.7853981	1.0267658
	0.3780068	0.4861701	0.1424491	2.2196817	2.7016726	0.5965917	0.3170125					
934	0.1853161	0.1853160	0.5194893	0.0836074	0.0240173	-0.7484382	-0.4750280	0.7724552	0.3493014	0.4920962	0.7853981	1.0262760
	0.3759731	0.4869614	0.1408915	2.2204380	2.7032738	0.5953888	0.3154813					
935	0.1842334	0.1842333	0.5184299	0.0825174	0.0236968	-0.7490941	-0.4753742	0.7727508	0.3493327	0.4920847	0.7853981	1.0255375
	0.3739650	0.4877622	0.1393246	2.2211914	2.7048532	0.5941875	0.3139690					
936	0.1831497	0.1831496	0.5173675	0.0814266	0.0233765	-0.7497517	-0.4757211	0.7731282	0.3493552	0.4920731	0.7853981	1.0248451
	0.3719546	0.4885617	0.1377518	2.2219534	2.7064323	0.5929846	0.3124556					
937	0.1820655	0.1820654	0.5163045	0.0803354	0.0230563	-0.7504116	-0.4760694	0.7734680	0.3493779	0.4920615	0.7853981	1.0241489
	0.3699437	0.4893605	0.1361719	2.2227221	2.7080212	0.5917830	0.3109418					
938	0.1809800	0.1809799	0.5152394	0.0792434	0.0227361	-0.7510661	-0.4764141	0.7738022	0.3493989	0.4920502	0.7853981	1.0234642
	0.3679293	0.4901578	0.1346847	2.2235012	2.7096186	0.5905799	0.3094263					
939	0.1799044	0.1798943	0.5141745	0.0781509	0.0224159	-0.7517229	-0.4767602	0.7741387	0.3494208	0.4920385	0.7853981	1.0227757
	0.3659155	0.4909546	0.1329904	2.2242861	2.7112226	0.5893787	0.3079109					
940	0.1788073	0.1788076	0.5131075	0.0770575	0.0220956	-0.7523792	-0.4771059	0.7744749	0.3494414	0.4920273	0.7853981	1.0220981
	0.3638987	0.4917502	0.1313884	2.2250824	2.7128344	0.5881769	0.3063942					
941	0.1777207	0.1777205	0.5121407	0.0759638	0.0217754	-0.7530376	-0.4774526	0.7748131	0.3494628	0.4920157	0.7853981	1.0213966
	0.3618815	0.4925448	0.1297793	2.2258844	2.7144518	0.5869769	0.3048772					
942	0.1766317	0.1766316	0.5110692	0.0748692	0.0214552	-0.7536912	-0.4777964	0.7751464	0.3494842	0.4920044	0.7853981	1.0207157
	0.3598607	0.4933370	0.1281630	2.2266975	2.7160788	0.5857735	0.3033577					
943	0.1755430	0.1755428	0.5098996	0.0737741	0.0211350	-0.7543466	-0.4781412	0.7754816	0.3495014	0.4919932	0.7853981	1.0200319
	0.3578395	0.4941286	0.1265390	2.2275190	2.7177124	0.5845734	0.3018386					
944	0.1744531	0.1744530	0.5088276	0.0726792	0.0208147	-0.7550020	-0.4784858	0.7758167	0.3495201	0.4919822	0.7853981	1.0193481
	0.3558170	0.4949185	0.1249074	2.2283487	2.7193537	0.5833724	0.3003184					
945	0.1733624	0.1733623	0.5077557	0.0715818	0.0204945	-0.7556521	-0.4788272	0.7761466	0.3495358	0.4919710	0.7853981	1.0186758
	0.3537925	0.4957070	0.1232682	2.2291800	2.7210035	0.5821731	0.2987971					
946	0.1722717	0.1722716	0.5066840	0.0704846	0.0201743	-0.7563088	-0.4791722	0.7764831	0.3495600	0.4919597	0.7853981	1.0179901
	0.3517674	0.4964949	0.1216207	2.2301377	2.7226691	0.5809754	0.2972761					
947	0.1711801	0.1711800	0.5056112	0.0693869	0.0198541	-0.7569608	-0.4795145	0.7768149	0.3495757	0.4919487	0.7853981	1.0173149
	0.3497407	0.4972805	0.1199659	2.2310959	2.7243252	0.5797782	0.2957539					
948	0.1700870	0.1700869	0.5045350	0.0682884	0.0195338	-0.7576125	-0.4798564	0.7771463	0.3495973	0.4919379	0.7853981	1.0166407
	0.3477110	0.4980637	0.1183335	2.2317638	2.7259979	0.5785790	0.2942300					
949	0.1689933	0.1689932	0.5034571	0.0671895	0.0192136	-0.7582662	-0.4801995	0.7774758	0.3496141	0.4919269	0.7853981	1.0159636
	0.3456801	0.4988444	0.1166338	2.2326412	2.7276773	0.5773797	0.2927054					
950	0.1678985	0.1678984	0.5023776	0.0660856	0.0188934	-0.7589151	-0.4805396	0.7778084	0.3496302	0.4919161	0.7853981	1.0152950
	0.3436667	0.4996230	0.1149560	2.2335300	2.7293663	0.5761804	0.2911795					
951	0.1668034	0.1668033	0.5012992	0.0649894	0.0185732	-0.7595679	-0.4808817	0.7781417	0.3496476	0.4919051	0.7853981	1.0146198
	0.3416132	0.5004000	0.1132702	2.2344275	2.7310619	0.5749838	0.2896535					
952	0.1657070	0.1657069	0.5002165	0.0638883	0.0182529	-0.7602185	-0.4812226	0.7784714	0.3496621	0.4918945	0.7853981	1.0139494
	0.3395766	0.5011737	0.1115767	2.2353363	2.7327662	0.5737844	0.2881252					
953	0.1646097	0.1646096	0.4991331	0.0627867	0.0179327	-0.7608675	-0.4815623	0.7788006	0.3496765	0.4918836	0.7853981	1.0132828
	0.3375362	0.5019448	0.1098756	2.2362566	2.7344780	0.5725858	0.2865973					
954	0.1635117	0.1635116	0.4980476	0.0616844	0.0176125	-0.7615184	-0.4819033	0.7791308	0.3496858	0.4918730	0.7853981	1.0126133
	0.3354985	0.5027133	0.1081663	2.2371864	2.7361975	0.5713869	0.2850679					
955	0.1624126	0.1624125	0.4969605	0.0605815	0.0172923	-0.7621678	-0.4822427	0.7794601	0.3497028	0.4918624	0.7853981	1.0119467
	0.3334565	0.5034787	0.1064490	2.2381277	2.7379255	0.5701883	0.2835373					
956	0.1613126	0.1613125	0.4958731	0.0594777	0.0169720	-0.7628151	-0.4825811	0.7797871	0.3497156	0.4918515	0.7853981	1.0112848
	0.3314128	0.5042414	0.1047234	2.2390904	2.7396622	0.5689902	0.2820057					
957	0.1602115	0.1602114	0.4947827	0.0583736	0.0166518	-0.7634635	-0.4829193	0.7801153	0.3497264	0.4918413	0.7853981	1.0106211
	0.3293676	0.5050005	0.1029901	2.2400436	2.7414064	0.5677913	0.2804734					
958	0.1591992	0.1591991	0.4936912	0.0572685	0.0163316	-0.7641124	-0.4832557	0.7804439	0.3497444	0.4918307	0.7853981	1.0099784
	0.3272995	0.5057469	0.1012481	2.2410288	2.7431850	0.5665928	0.2789246					
959	0.1579961	0.1579960	0.4925971	0.0561631	0.0160114	-0.7647592	-0.4835939	0.7807706	0.3497537	0.4918201	0.7853981	1.0094185
	0.3252501	0.5064985	0.0994985	2.2420158	2.7449465	0.5653934	0.2773895					
960	0.1568925	0.1568924	0.4915916	0.0550567	0.0156911	-0.7654046	-0.4839294	0.7810357	0.3497623	0.4918098	0.7853981	1.0087624
	0.3231986	0.5072471	0.0977402	2.2431162	2.7467165	0.5641943	0.2758532					
961	0.1557872	0.1557872	0.4904040	0.0539499	0.0153709	-0.7660476	-0.4842636	0.7813585	0.3497659	0.4917996	0.7853981	1.0081120
	0.3211446	0.5079514	0.0959738	2.2442281	2.7484951	0.5629947	0.2743165					
962	0.1546820	0.1546819	0.4893153	0.0528422	0.0150506	-0.7666854	-0.4845975	0.7816860	0.3497770	0.4917890	0.7853981	1.0074511
	0.3190903	0.5087324	0.0941986	2.2452514	2.7502804	0.5617959	0.2727792					
963	0.1535761	0.1535760	0.4882071	0.0517340	0.0147305	-0.7673177	-0.4849293	0.7820081	0.3497851	0.4917791	0.7853981	1.0068026
	0.3170342	0.5094699	0.0924149	2.2462871	2.7523761	0.5605993	0.2712412					

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964	0.1524693	0.1524692	0.4871070	0.0596250	0.0144102	-0.7679267	-0.4852464	0.7823369	0.3497922	0.4917686	0.7853981	1.0061407
	0.3149770	0.5102035	0.0906222	2.2471352	2.7538786	0.5594025	-0.2697023					
965	0.1513616	0.1513615	0.4860057	0.0495154	0.0149900	-0.7685707	-0.4855916	0.7826607	0.3497988	0.4917587	0.7853981	1.0054893
	0.3129171	0.5109323	0.0988212	2.2481985	2.7556915	0.5582061	-0.2681626					
966	0.1502525	0.1502528	0.4848027	0.0484051	0.0137697	-0.7692149	-0.4859173	0.7829847	0.3498049	0.4917485	0.7853981	1.0048380
	0.3108560	0.5116567	0.0870113	2.2492733	2.7575130	0.5570099	-0.2666219					
967	0.1491432	0.1491430	0.4837968	0.0472542	0.0134495	-0.7698560	-0.4862503	0.7833056	0.3498088	0.4917386	0.7853981	1.0041933
	0.3087922	0.5123759	0.0851932	2.2503624	2.7593431	0.5558125	-0.2650799					
968	0.1480324	0.1480323	0.4826902	0.0461824	0.0131293	-0.7704992	-0.4865947	0.7836285	0.3498130	0.4917287	0.7853981	1.0035448
	0.3067265	0.5130505	0.0833656	2.2514648	2.7611818	0.5546163	-0.2635368					
969	0.1469217	0.1469216	0.4815848	0.0450702	0.0128091	-0.7711399	-0.4869176	0.7839490	0.3498185	0.4917188	0.7853981	1.0029020
	0.3046611	0.5138007	0.0815291	2.2525816	2.7630310	0.5534230	-0.2619941					
970	0.1458057	0.1458056	0.4804765	0.0439579	0.0124888	-0.7717829	-0.4872518	0.7842718	0.3498229	0.4917089	0.7853981	1.0022545
	0.3025929	0.5145057	0.0796835	2.2537127	2.7649478	0.5522291	-0.2604500					
971	0.1446971	0.1446970	0.4793682	0.0428434	0.0121686	-0.7724259	-0.4875861	0.7845946	0.3498269	0.4916990	0.7853981	1.0016079
	0.3005238	0.5152050	0.0778292	2.2548571	2.7667542	0.5510362	-0.2589054					
972	0.1435830	0.1435829	0.4782560	0.0417289	0.0118484	-0.7730652	-0.4879175	0.7849136	0.3498287	0.4916894	0.7853981	1.0009689
	0.2984505	0.5159582	0.0759656	2.2560185	2.7686300	0.5498417	-0.2573591					
973	0.1424682	0.1424682	0.4771415	0.0406140	0.0115282	-0.7737070	-0.4882505	0.7852352	0.3498295	0.4916795	0.7853981	1.0003252
	0.2963772	0.5165851	0.0740934	2.2571945	2.7705135	0.5486470	-0.2558122					
974	0.1413521	0.1413521	0.4760259	0.0394581	0.0112079	-0.7743464	-0.4885821	0.7855543	0.3498296	0.4916700	0.7853981	0.9996877
	0.2943005	0.5172657	0.0722116	2.2583857	2.7724075	0.5474526	-0.2542639					
975	0.1402357	0.1402357	0.4749104	0.0383818	0.0108877	-0.7749869	-0.4889138	0.7858747	0.3498304	0.4916605	0.7853981	0.9990475
	0.2922238	0.5179406	0.0703206	2.2595521	2.7743101	0.5462604	-0.2527154					
976	0.1391185	0.1391184	0.4737942	0.0372645	0.0105675	-0.7756258	-0.4892449	0.7861933	0.3498313	0.4916509	0.7853981	0.9984111
	0.2901450	0.5186093	0.0684198	2.2608147	2.7762232	0.5450694	-0.2511662					
977	0.1379917	0.1379916	0.4726759	0.0361467	0.0102473	-0.7762163	-0.4895695	0.7864636	0.3498368	0.4916414	0.7853981	0.9978716
	0.2880486	0.5192609	0.0665100	2.2620640	2.7781677	0.5438783	-0.2496040					
978	0.1368722	0.1368722	0.4715558	0.0350281	0.0099271	-0.7768549	-0.4898902	0.7867819	0.3498359	0.4916318	0.7853981	0.9972363
	0.2859651	0.5199149	0.0645005	2.2633290	2.7800989	0.5426974	-0.2480527					
979	0.1357522	0.1357522	0.4704338	0.0339090	0.0096068	-0.7774922	-0.4902097	0.7870550	0.3498338	0.4916226	0.7853981	0.9966041
	0.2838808	0.5205613	0.0626618	2.2645522	2.7820406	0.5414965	-0.2465008					
980	0.1346312	0.1346312	0.4693117	0.0327889	0.0092866	-0.7781303	-0.4905403	0.7874169	0.3498326	0.4916130	0.7853981	0.9959705
	0.2817944	0.5212005	0.0607230	2.2658135	2.7839918	0.5403175	-0.2449479					
981	0.1335095	0.1335094	0.4681860	0.0316684	0.0089664	-0.7787654	-0.4908683	0.7877318	0.3498285	0.4916039	0.7853981	0.9953436
	0.2797062	0.5218313	0.0587751	2.2671909	2.7859526	0.5391169	-0.2433944					
982	0.1323864	0.1323864	0.4670594	0.0305471	0.0086461	-0.7794045	-0.4911985	0.7880507	0.3498245	0.4915946	0.7853981	0.9947092
	0.2776161	0.5224538	0.0568171	2.2685165	2.7879229	0.5379273	-0.2418356					
983	0.1312627	0.1312626	0.4659313	0.0294251	0.0083259	-0.7800392	-0.4915264	0.7883651	0.3498159	0.4915854	0.7853981	0.9940836
	0.2755240	0.5230677	0.0548495	2.2698612	2.7899036	0.5367385	-0.2402843					
984	0.1301378	0.1301377	0.4648009	0.0283022	0.0080057	-0.7806757	-0.4918550	0.7886814	0.3498139	0.4915767	0.7853981	0.9934551
	0.2734296	0.5236728	0.0528718	2.2712250	2.7919943	0.5355492	-0.2387277					
985	0.1290131	0.1290130	0.4636740	0.0271789	0.0076855	-0.7813091	-0.4921816	0.7889946	0.3498114	0.4915674	0.7853981	0.9928328
	0.2713355	0.5242701	0.0508839	2.2726059	2.7939948	0.5343656	-0.2371719					
986	0.1278865	0.1278868	0.4625418	0.0260546	0.0073652	-0.7819455	-0.4925101	0.7893107	0.3498052	0.4915586	0.7853981	0.9922054
	0.2692396	0.5248573	0.0488961	2.2740078	2.7959051	0.5331787	-0.2356146					
987	0.1267601	0.1267601	0.4614111	0.0249299	0.0071453	-0.7825764	-0.4928351	0.7896214	0.3498008	0.4915497	0.7853981	0.9915890
	0.2671407	0.5254349	0.0468782	2.2754297	2.7979269	0.5319855	-0.2340563					
988	0.1256325	0.1256325	0.4602783	0.0238042	0.0069244	-0.7832140	-0.4931630	0.7899387	0.3497952	0.4915408	0.7853981	0.9909599
	0.2650411	0.5260026	0.0449595	2.2768737	2.7999573	0.5308123	-0.2324986					
989	0.1245040	0.1245040	0.4591444	0.0226780	0.0066946	-0.7838449	-0.4934889	0.7902495	0.3497894	0.4915320	0.7853981	0.9903441
	0.2629354	0.5265558	0.0428316	2.2783337	2.8019921	0.5296301	-0.2309354					
990	0.1233745	0.1233745	0.4580089	0.0215518	0.0064643	-0.7844777	-0.4938148	0.7905620	0.3497830	0.4915231	0.7853981	0.9897252
	0.2608355	0.5271661	0.0407927	2.2798176	2.8040514	0.5284485	-0.2293795					
991	0.1222370	0.1222370	0.4568728	0.0204232	0.0062341	-0.7851027	-0.4941391	0.7908748	0.3497815	0.4915143	0.7853981	0.9891052
	0.2587172	0.5276313	0.0387437	2.2813339	2.8061323	0.5272684	-0.2278233					
992	0.1211130	0.1211129	0.4557368	0.0192947	0.0060039	-0.7857447	-0.4944671	0.7911885	0.3497654	0.4915057	0.7853981	0.9884858
	0.2566237	0.5281644	0.0366840	2.2828593	2.8081865	0.5260887	-0.2262576					
993	0.1199737	0.1199737	0.4545948	0.0181657	0.0057737	-0.7863246	-0.4947902	0.7914982	0.3497658	0.4914972	0.7853981	0.9878526
	0.2545014	0.5286656	0.0346141	2.2844105	2.8102884	0.5249091	-0.2246857					
994	0.1188402	0.1188401	0.4534534	0.0170357	0.0054934	-0.7869037	-0.4951124	0.7917971	0.3497571	0.4914886	0.7853981	0.9873425
	0.2523897	0.5291637	0.0325333	2.2859850	2.8123837	0.5237304	-0.2231223					
995	0.1177071	0.1177071	0.4523134	0.0159052	0.0052132	-0.7875055	-0.4954413	0.7920787	0.3497457	0.4914802	0.7853981	0.9867215
	0.2502785	0.5296507	0.0304420	2.2875605	2.8144884	0.5225555	-0.2215601					
996	0.1165726	0.1165726	0.4511705	0.0147737	0.0049331	-0.7882266	-0.4957715	0.7923456	0.3497409	0.4914716	0.7853981	0.9861140
	0.2481652	0.5301237	0.0283396	2.2892017	2.8166037	0.5213798	-0.2199966					
997	0.1154373	0.1154373	0.4500269	0.0136418	0.0046529	-0.7888572	-0.4961053	0.7926999	0.3497317	0.4914635	0.7853981	0.9855021
	0.2460456	0.5305827	0.0262265	2.2908468	2.8187304	0.5202156	-0.2184325					
998	0.1143007	0.1143006	0.4488811	0.0125089	0.0043725	-0.7894856	-0.4964379	0.7930081	0.3497220	0.4914550	0.7853981	0.9848946
	0.2439321	0.5310271	0.0241028	2.2925177	2.8208685	0.5190518	-0.2168671					
999	0.1131641	0.1131641	0.4477361	0.0113755	0.0040923	-0.7901142	-0.4967704	0.7933165	0.3497131	0.4914468	0.7853981	0.9842874
	0.2418140	0.5314578	0.0219681	2.2942142	2.8230171	0.5178610	-0.2153025					

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                                                  ...-0.7907459-0.4970343 0.7936280 0.3497022 0.4914386 0.7853981 0.9836744
     0.2296934 0.5318727 0.0198221 2.2959366 2.8251762 0.5166892 0.2137365
1001 0.1108876 0.1108875 0.4454400 0.0021063 0.0025619-0.7913737-0.4973562 0.7939356 0.3496923 0.4914304 0.7853981 0.9830693
     0.2375715 0.5322723 0.0176653 2.2976866 2.8273468 0.5155204 0.2121705
1002 0.1097471 0.1097471 0.4442865 0.0079705 0.0022416-0.7920026-0.4976782 0.7942442 0.3496784 0.4514222 0.7853981 0.9824626
     0.2354461 0.5326537 0.0154970 2.2994642 2.8295208 0.5143481 0.2106025
1003 0.1086062 0.1066062 0.4431344 0.0068342 0.0019214-0.7926274-0.4979581 0.7945488 0.3496663 0.4914144 0.7853981 0.9818642
     0.2333195 0.5330150 0.0133178 2.3012705 2.8317232 0.5131798 0.2090346
1004 0.1074581 0.1074581 0.4419803 0.0056570 0.0016012-0.7932216-0.4583016 0.7948228 0.3496575 0.4914062 0.7853981 0.9813263
     0.2311795 0.5333567 0.0111268 2.3031158 2.9339434 0.5120119 0.2074574
1005 0.1063156 0.1063156 0.4408250 0.0045592 0.0012819-0.7938479-0.4986219 0.7951288 0.3496439 0.4913984 0.7853981 0.9807256
     0.2290497 0.5336863 0.0089249 2.3049803 2.8361597 0.5108453 0.2058887
1006 0.1051721 0.1051720 0.4356697 0.0034274 0.0009607-0.7944739-0.4989421 0.7954347 0.3496311 0.4513905 0.7853981 0.9801258
     0.2269180 0.5339574 0.0067110 2.3068752 2.8383884 0.5096811 0.2043193
1007 0.1040274 0.1040273 0.4385107 0.0022812 0.0006405-0.7950981-0.4992613 0.7957366 0.3496159 0.4913827 0.7853981 0.9795303
     0.2247840 0.5342882 0.0044860 2.3088017 2.8406286 0.5085158 0.2027491
1008 0.1028810 0.1028809 0.4373468 0.0011410 0.0003203-0.7957215-0.4995797 0.7960418 0.3495975 0.4913753 0.7853981 0.9789361
     0.2226465 0.5345577 0.0022489 2.3107615 2.8428802 0.5073480 0.2011772
1009 0.1017346 0.1017346 0.4361849 0.0000002 0.0000001-0.7963483-0.4998997 0.7963484 0.3495810 0.4913674 0.7853981 0.9783359
     0.2205091 0.5348079 0.0000004 2.3127527 2.8451424 0.5061849 0.1996064
   0.43618   0.62164   2.56381 -0.50618
1 IMAGE PLANE SPOT DIAGRAM ANALYSIS:

 THICKNESS =0.0500000  U =0.0          ALFAP =0.0          R =1.0000000

 CENTROID: ZCENTR = 0.0,   YCENTR =  0.0027303

 STANDARD DEVIATIONS:  SIGMAY =  0.0000085  SIGMAZ =  0.0000194

 RMS SPOT SIZE: RMSRAD =  0.0052860

 SPOT DIAGRAM ENERGY DENSITY VS. RADIUS FROM CENTROID:

  IZ4    RADIUS    FRACTION

   1  0.0050000  0.6776316
   2  0.0100000  0.5605263
   3  0.0150000  0.9835526
   4  0.0200000  1.0000000
   5  0.0250000  1.0000000
   6  0.0300000  1.0000000
   7  0.0350000  1.0000000
   8  0.0400000  1.0000000
   9  0.0450000  1.0000000
  10  0.0500000  1.0000000
  11  0.0550000  1.0000000
  12  0.0600000  1.0000000
  13  0.0649999  1.0000000
  14  0.0699999  1.0000000
  15  0.0749999  1.0000000
  16  0.0799999  1.0000000
  17  0.0849999  1.0000000
  18  0.0899999  1.0000000
  19  0.0949999  1.0000000
  20  0.0999999  1.0000000
  21  0.1049999  1.0000000
  22  0.1099999  1.0000000
  23  0.1149999  1.0000000
  24  0.1199999  1.0000000
  25  0.1249999  1.0000000
  26  0.1299999  1.0000000
  27  0.1349999  1.0000000
  28  0.1399999  1.0000000
  29  0.1449999  1.0000000
  30  0.1499999  1.0000000
  31  0.1549999  1.0000000
  32  0.1599998  1.0000000
  33  0.1649998  1.0000000
  34  0.1699998  1.0000000
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 35  0.1749998E  1.0000000
 36  0.1799998E  1.0000000
 37  0.1849998E  1.0000000
 38  0.1899998E  1.0000000
 39  0.1949998E  1.0000000
 40  0.1999998E  1.0000000
 41  0.2049998E  1.0000000
 42  0.2099998E  1.0000000
 43  0.2149998E  1.0000000
 44  0.2199998E  1.0000000
 45  0.2249998E  1.0000000
 46  0.2299998E  1.0000000
 47  0.2349998E  1.0000000
 48  0.2399998E  1.0000000
 49  0.2449998E  1.0000000
 50  0.2499998E  1.0000000
 51  0.2549998E  1.0000000
 52  0.2599998E  1.0000000
 53  0.2649997E  1.0000000
 54  0.2699997E  1.0000000
 55  0.2749997E  1.0000000
 56  0.2799997E  1.0000000
 57  0.2849997E  1.0000000
 58  0.2899997E  1.0000000
 59  0.2949997E  1.0000000
 60  0.2999997E  1.0000000
 61  0.3049997E  1.0000000
 62  0.3099997E  1.0000000
 63  0.3149997E  1.0000000
 64  0.3199997E  1.0000000
 65  0.3249997E  1.0000000
 66  0.3299997E  1.0000000
 67  0.3349997E  1.0000000
 68  0.3399997E  1.0000000
 69  0.3449997E  1.0000000
 70  0.3499997E  1.0000000
 71  0.3549997E  1.0000000
 72  0.3599997E  1.0000000
 73  0.3649997E  1.0000000
 74  0.3699996E  1.0000000
 75  0.3749996E  1.0000000
 76  0.3799996E  1.0000000
 77  0.3849996E  1.0000000
 78  0.3899996E  1.0000000
 79  0.3949996E  1.0000000
 80  0.3999996E  1.0000000
 81  0.4049996E  1.0000000
 82  0.4099996E  1.0000000
 83  0.4149996E  1.0000000
 84  0.4199996E  1.0000000
 85  0.4249996E  1.0000000
 86  0.4299996E  1.0000000
 87  0.4349996E  1.0000000
 88  0.4399996E  1.0000000
 89  0.4449996E  1.0000000
 90  0.4499996E  1.0000000
 91  0.4549996E  1.0000000
 92  0.4599996E  1.0000000
 93  0.4649996E  1.0000000
 94  0.4699996E  1.0000000
 95  0.4749995E  1.0000000
 96  0.4799995E  1.0000000
 97  0.4849995E  1.0000000
 98  0.4899995E  1.0000000
 99  0.4949995E  1.0000000
100  0.4999995E  1.0000000
SPOT DIAGRAM CALCULATIONS COMPLETE.
TO OBTAIN PLOTS FROM THE PLOTTER OR THE PRINTER,
ISSUE THE FOLLOWING COMMAND:
        FOR PRINTER PLOTS          ENTER "LENSCOM PRINTER"
        FOR PLOTTER GRAPHS         ENTER "LENSCOM PLOTTER"
END OF PROGRAM
```

GRIN PARAMETERS(2):

ALPHA = 0.7853579 BETA = 0.3227880 RADIUS = 1.00000 INCIDENT ANGLE = 0.0 ITERATIONS = 1008

EDGE THICKNESS = 0.0500000 INDICES OF REFRACTION: N1 = 1.00000 N2 = 1.42157 N3 = 1.00000

FOCAL LENGTH FROM STATION ZERO = 4.00000 DELTA BETA= 0.00032

CENTER OF SYM(XC)=-0.07000 CHANGE IN N2(X)=-0.050 ALPAP= 0.0

NOTE:X-COORDINATES HAS BEEN SHIFTED IN CASE=2 BY X2(K);NOW,X2(K)=0.0 ETC.

J	X1	Y1	X2	Y2	BETA	I2P	I2	ETA	T	I1P	I1	DYDXT
	E	THETAE	THETAO	PSI	PSIO	RR	RF					
	0.43618	0.62164	3.56381	-0.50618								

ISKEW RAY TRACE PARAPETERS:

ALPAP= 0.0 GRID= 0.1000000 SEE LENS PARAMETERS ABOVE.

RAY	RAYY	RAYZ	XO	YO	XI	YI	ZI	OPL	YIM	ZIM	NTNCTY	XDIAPT	YDIAPT
	PHII	PHIIP	CKPP	CLPP	CMPP	D3	D1	NUM6	NUM7	NUM8			
1	0.0	0.20000	-0.23618	0.0	0.09771	0.00036	0.09844	4.24078	0.00549	-0.01646	1.00000	-0.603E-01	0.475E-02
	0.4641	0.7285	0.9995	0.0015	-0.0331	3.4680	0.4362	0.2000	0.0	-0.5837			
2	0.0	0.30000	-0.13618	0.0	0.19229	0.00044	0.20024	4.17358	0.00319	-0.00311	1.00000	0.385E+00	0.315E-02
	0.4326	0.6704	0.9982	0.0008	-0.0602	3.3776	0.4362	0.3000	0.0	-0.5618			
3	0.0	0.40000	-0.03618	0.0	0.28135	0.00060	0.30392	4.09773	0.00280	-0.00462	1.00000	0.387E+00	0.277E-02
	0.3878	0.5919	0.9956	0.0007	-0.0936	3.2969	0.4362	0.4000	0.0	-0.5361			
4	0.0	0.50000	0.06382	0.0	0.36367	0.00117	0.40984	4.01756	0.00395	-0.00300	1.00000	0.413E+00	0.393E-02
	0.3347	0.5033	0.9918	0.0009	-0.1279	3.2267	0.4362	0.5000	0.0	-0.5107			
5	0.0	0.60000	0.16382	0.0	0.43781	0.00167	0.51836	3.93575	0.00434	-0.00165	1.00000	0.426E+00	0.433E-02
	0.2700	0.3999	0.9864	0.0008	-0.1641	3.1690	0.4362	0.6000	0.0	-0.4860			
6	0.0	0.70000	0.26382	0.0	0.50243	0.00217	0.62983	3.85365	0.00445	-0.00103	1.00000	0.431E+00	0.448E-02
	0.1914	0.2796	0.9794	0.0007	-0.2018	3.1257	0.4362	0.7000	0.0	-0.4633			
7	0.0	0.80000	0.36382	0.0	0.55575	0.00214	0.74449	3.77239	0.00363	-0.00250	1.00000	0.426E+00	0.362E-02
	0.0970	0.1401	0.9705	0.0005	-0.2417	3.0994	0.4362	0.8000	0.0	-0.4445			
8	0.0	0.90000	0.46382	0.0	0.59604	0.00277	0.86261	3.69061	0.00392	-0.00040	1.00000	0.435E+00	0.392E-02
	0.0083	0.0118	0.9602	0.0004	-0.2752	3.0997	0.4362	0.9000	0.0	-0.4317			
9	0.10000	0.10000	-0.29476	0.10000	0.14001	0.02812	0.02787	4.27035	-0.00538	-0.01471	1.00000	-0.781E+00	0.619E-02
	0.4836	0.7652	0.9999	-0.0055	-0.0121	3.5242	0.4362	0.1414	0.1000	-0.5977			
10	0.10000	0.20000	-0.21256	0.10000	0.12048	0.05511	0.10920	4.22624	0.00037	-0.01163	1.00000	0.105E+00	0.564E-02
	0.4583	0.7175	0.9993	-0.0159	-0.0351	3.4459	0.4362	0.2236	0.1000	-0.5702			
11	0.10000	0.30000	-0.11596	0.10000	0.23713	0.06897	0.23568	4.16185	0.00187	-0.01572	1.00000	0.345E+00	0.272E-02
	0.4252	0.6571	0.9978	-0.0202	-0.0629	3.3643	0.4362	0.3162	0.1000	-0.5573			
12	0.10000	0.40000	-0.03387	0.10000	0.29184	0.07773	0.39716	4.08773	0.00364	-0.00227	1.00000	0.412E+00	0.418E-02
	0.3833	0.5941	0.9953	-0.0225	-0.0941	3.2874	0.4362	0.4123	0.1000	-0.5335			
13	0.10000	0.50000	0.07372	0.10000	0.37143	0.08376	0.41203	4.00929	0.00421	-0.00129	1.00000	0.427E+00	0.444E-02
	0.3392	0.4959	0.9914	-0.0247	-0.1283	3.2200	0.4362	0.5099	0.1000	-0.5085			
14	0.10000	0.60000	0.17209	0.10000	0.44359	0.08831	0.52332	3.92863	0.00413	-0.00027	1.00000	0.435E+00	0.417E-02
	0.2852	0.3924	0.9860	-0.0266	-0.1644	3.1644	0.4362	0.6083	0.1000	-0.4942			
15	0.10000	0.70000	0.27092	0.10000	0.51663	0.09231	0.63113	3.84831	0.00382	-0.00398	1.00000	0.418E+00	0.436E-02

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     0.1837  C.2682  C.9787 -0.0283 -0.2039  3.1237  0.4362  0.7071  0.1000 -0.4617

  16 C.10000 C.80000 C.37004 0.10000 0.55858 0.09546 0.74569 3.76727 0.00341-0.00272 1.00000  0.425E+00 C.375E-02
     0.0909  0.1311  0.9659 -0.0297 -0.2415  3.0984  0.4362  0.8062  0.1000 -0.4436

  17 0.10000 C.90000 0.46935 0.10000 0.59788 0.09831 0.86267 3.68702 0.00298-0.00274 1.00000  0.427E+00 C.328E-02
     0.0159  C.0228  0.9994 -0.0308 -0.2803  3.0914  0.4362  0.9055  0.1000 -0.4312

  18 0.20000 C.0     -0.23618 0.20000 0.09779 0.09864 0.00036 4.24076-0.01524 0.00549 1.00000 -0.327E+01 C.106E+00
     0.4646  C.7293  0.9955 -0.0328  0.0015  3.4680  0.4362  0.2000  0.2000 -0.5839

  19 C.20000 C.10000-0.21258 0.20000 0.12046 0.10960 0.05431 4.22611-0.00336-0.00765 1.00000  0.112E-01 C.106E-01
     0.4598  C.7201  0.9953 -0.0328 -0.0180  3.4458  0.4362  0.2236  0.2000 -0.5799

  20 0.20000 C.20000-0.15334 0.20000 0.17644 0.12939 0.12891 4.18596-0.00320-0.00414 1.00000  0.331E+00 C.383E-02
     0.4394  C.6826  0.9885 -0.0382 -0.0352  3.3925  0.4362  0.2828  0.2000 -0.5661

  21 0.20000 C.30000-0.07563 0.20000 0.24692 0.14641 0.21823 4.12814 0.00263-0.00368 1.00000  0.381E+00 C.501E-02
     0.4076  0.6261  0.9968 -0.0432 -0.0667  3.3274  0.4362  0.3606  0.2000 -0.5467

  22 0.20000 C.40000 0.01103 0.20000 0.32110 0.15879 0.31599 4.06009 0.00133-0.00363 1.00000  0.355E+00 C.312E-02
     0.3646  C.5527  0.9940 -0.0483 -0.0980  3.2622  0.4362  0.4472  0.2000 -0.5242

  23 0.20000 C.50000 0.10233 0.20000 0.39328 0.16936 0.41833 3.98578 0.00542-0.00181 1.00000  0.423E+00 0.613E-02
     0.3128  C.4677  0.9903 -0.0512 -0.1312  3.2024  0.4362  0.5385  0.2000 -0.5014

  24 0.20000 C.60000 0.19627 0.20000 0.45995 0.17691 0.52520 3.90911 0.00352-0.00268 1.00000  0.420E+00 C.440E-02
     0.2460  C.3628  0.9844 -0.0550 -0.1674  3.1532  0.4362  0.6325  0.2000 -0.4783

  25 C.20000 C.70000 0.29183 0.20000 0.51857 0.18395 0.63552 3.83108 0.00356-0.00372 1.00000  0.418E+00 C.461E-02
     0.1656  C.2411  0.9770 -0.0579 -0.2051  3.1168  0.4362  0.7280  0.2000 -0.4575

  26 C.20000 C.80000 0.38044 0.20000 0.56688 0.19036 0.74948 3.75199 0.00435-0.00158 1.00000  0.428E+00 C.484E-02
     0.0730  C.1052  0.9682 -0.0601 -0.2428  3.0953  0.4362  0.8246  0.2000 -0.4408

  27 C.20000 C.90000 0.48577 0.20000 0.60297 0.19568 0.86720 3.67387 0.00328-0.00340 1.00000  0.425E+00 C.403E-02
     0.0347  C.0496  0.9575 -0.0622 -0.2816  3.0922  0.4362  0.9220  0.2000 -0.4298

  28 C.30000 C.0     -0.13618 0.30000 0.19230 0.20024 0.00097 4.17358-0.00307 0.00707 1.00000 -0.347E+01 C.232E+00
     0.4326  C.6704  0.9982 -0.0602  0.0018  3.3776  0.4362  0.3000  0.3000 -0.5618

  29 C.30000 C.10000-0.11596 0.30000 0.20713 0.20594 0.06819 4.16185-0.00396-0.00440 1.00000  0.233E+00 C.877E-02
     0.4252  C.6571  0.9978 -0.0624 -0.0216  3.3640  0.4362  0.3162  0.3000 -0.5573

  30 0.30000 C.20000-0.07563 0.30000 0.24692 0.21916 0.14502 4.12814 0.00143-0.00504 1.00000  0.325E+00 C.874E-02
     0.4076  C.6261  0.9968 -0.0654 -0.0451  3.3274  0.4362  0.3606  0.3000 -0.5467

  31 0.30000 C.30000-0.01192 0.30000 0.30198 0.23383 0.23202 4.07840 0.00190-0.00588 1.00000  0.356E+00 C.763E-02
     0.3765  C.5727  0.9949 -0.0707 -0.0726  3.2787  0.4362  0.4243  0.3000 -0.5301

  32 C.30000 C.40000 0.06382 0.30000 0.36367 0.24732 0.32703 4.01757 0.00198-0.00520 1.00000  0.386E+00 C.582E-02
     0.3347  C.5033  0.9918 -0.0759 -0.1030  3.2267  0.4362  0.5000  0.3000 -0.5107

  33 C.30000 C.50000 0.14691 0.30000 0.42596 0.25818 0.42796 3.94969 0.00168-0.00351 1.00000  0.411E+00 C.377E-02
     0.2816  C.4183  0.9874 -0.0807 -0.1358  3.1777  0.4362  0.5831  0.3000 -0.4930

  34 0.30000 C.60000 0.23464 0.30000 0.48477 0.26696 0.53392 3.87759-0.00141-0.00280 1.00000  0.420E+00 C.119E-05
     0.2146  C.3147  0.9815 -0.0855 -0.1711  3.1373  0.4362  0.6708  0.3000 -0.4694

  35 0.30000 C.70000 0.32539 0.30000 0.53668 0.27842 0.64230 3.80363 0.00390-0.00428 1.00000  0.416E+00 C.572E-02
     0.1346  C.1952  0.9741 -0.0883 -0.2181  3.1076  0.4362  0.7616  0.3000 -0.4511

  36 0.30000 C.80000 0.41822 0.30000 0.57540 0.28627 0.75594 3.72776 0.00361-0.00384 1.00000  0.425E+00 C.428E-02
     0.0419  C.0602  0.9652 -0.0914 -0.2451  3.0921  0.4362  0.8544  0.3000 -0.4367

  37 0.30000 C.90000 0.51250 0.30000 0.61044 0.29407 0.87217 3.65245 0.00266-0.00375 1.00000  0.424E+00 C.391E-02
     0.0656  C.0937  0.9544 -0.0942 -0.2834  3.0946  0.4362  0.9487  0.3000 -0.4281

  38 C.40000 C.0     -0.03618 0.40000 0.28135 0.30302 0.30091 4.09772-0.00462 0.00428 1.00000 -0.374E+01 C.388E+00
     0.3878  C.5919  0.9556 -0.0936  0.0010  3.2969  0.4362  0.4000  0.4000 -0.5361

  39 0.40000 C.10000-0.02387 0.40000 0.29195 0.30778 0.07525 4.08773 0.00256-0.00749 1.00000  0.140E+02 C.283E-01
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	0.3833	C.5841	C.9953	-0.0935	-0.0252	3.2874	0.4362	0.4123	0.4000	-0.5335			
40	0.40000	C.20000	0.01103	0.40000	0.32110	0.31664	0.15748	4.06005	-0.00103	-0.00387	1.00000	0.358E+00	0.659E-02
	0.2646	C.5527	0.9940	-0.0974	-0.0455	3.2622	0.4362	0.4472	0.4000	-0.5242			
41	0.40000	C.30000	0.06382	0.40000	0.36367	0.32879	0.24468	4.01758	0.00072	-0.00551	1.00000	0.361E+00	0.846E-02
	0.3347	C.5033	0.9918	-0.1017	-0.0777	3.2267	0.4362	0.5000	0.4000	-0.5107			
42	0.40000	C.40000	0.12950	0.40000	0.41340	0.34110	0.33886	3.96364	0.00306	-0.00332	1.00000	0.406E+00	0.628E-02
	0.2547	C.4388	0.9885	-0.1061	-0.1074	3.1869	0.4362	0.5657	0.4000	-0.4945			
43	0.40000	C.50000	0.20413	0.40000	0.46516	0.35325	0.43826	3.90272	0.00270	-0.00441	1.00000	0.405E+00	0.618E-02
	0.2398	C.3591	0.9838	-0.1113	-0.1405	3.1497	0.4362	0.6403	0.4000	-0.4764			
44	0.40000	C.60000	0.28433	0.40000	0.51468	0.36474	0.54254	3.83673	0.00265	-0.00501	1.00000	0.408E+00	0.600E-02
	0.1718	C.2503	0.9776	-0.1161	-0.1756	3.1190	0.4362	0.7211	0.4000	-0.4585			
45	0.40000	C.70000	0.37004	0.40000	0.55859	0.37544	0.65131	3.76727	0.00298	-0.00432	1.00000	0.416E+00	0.543E-02
	0.0909	C.1311	0.9699	-0.1202	-0.2116	3.0984	0.4362	0.8062	0.4000	-0.4436			
46	0.40000	C.80000	0.45824	0.40000	0.59417	0.38564	0.76414	3.69571	0.00341	-0.00338	1.00000	0.423E+00	0.509E-02
	0.0090	C.0043	0.9608	-0.1237	-0.2483	3.0910	0.4362	0.8944	0.4000	-0.4322			
47	0.40000	C.90000	0.54870	0.40000	0.61881	0.39557	0.88079	3.62402	0.00236	-0.00556	1.00000	0.416E+00	0.501E-02
	0.1054	C.1561	0.9468	-0.1268	-0.2869	3.1006	0.4362	0.9849	0.4000	-0.4267			
48	0.50000	C.0	0.06382	0.50000	0.36367	0.40984	0.00169	4.01756	-0.00300	0.00571	1.00000	-0.411E+01	0.584E+00
	0.3347	C.5033	0.9518	-0.1279	0.0012	3.2266	0.4362	0.5000	0.5000	-0.5107			
49	0.50000	C.10000	0.07372	0.50000	0.37144	0.41274	0.08019	4.00519	0.00113	-0.00750	1.00000	0.163E+00	0.363E-01
	0.3302	C.4959	0.9914	-0.1278	-0.0272	3.2209	0.4362	0.5099	0.5000	-0.5085			
50	0.50000	C.20000	0.10233	0.50000	0.39327	0.41948	0.16649	3.98578	0.00167	-0.00327	1.00000	0.375E+00	0.971E-02
	0.3128	C.4677	0.9900	-0.1305	-0.0530	3.2025	0.4362	0.5385	0.5000	-0.5014			
51	0.50000	C.30000	0.14691	0.50000	0.42596	0.42944	0.25572	3.94565	0.00146	-0.00497	1.00000	0.376E+00	0.863E-02
	0.2816	C.4183	0.9874	-0.1350	-0.0820	3.1778	0.4362	0.5831	0.5000	-0.4900			
52	0.50000	C.40000	0.20413	0.50000	0.46517	0.44087	0.34559	3.90273	0.00173	-0.00459	1.00000	0.393E+00	0.790E-02
	0.2398	C.3531	0.9838	-0.1394	-0.1127	3.1497	0.4362	0.6403	0.5000	-0.4764			
53	0.50000	C.50000	0.27092	0.50000	0.52663	0.45294	0.44510	3.84831	0.00157	-0.00624	1.00000	0.394E+00	0.775E-02
	0.1837	C.2682	0.9787	-0.1445	-0.1459	3.1237	0.4362	0.7071	0.5000	-0.4617			
54	0.50000	C.60000	0.34484	0.50000	0.54655	0.46503	0.55254	3.78745	0.00375	-0.00440	1.00000	0.412E+00	0.743E-02
	0.1169	C.1691	0.9724	-0.1487	-0.1796	3.1028	0.4362	0.7813	0.5000	-0.4478			
55	0.50000	C.70000	0.42405	0.50000	0.59166	0.47688	0.66121	3.72307	0.00425	-0.00378	1.00000	0.419E+00	0.694E-02
	0.0255	C.0510	0.9646	-0.1529	-0.2151	3.0917	0.4362	0.8602	0.5000	-0.4360			
56	0.50000	C.80000	0.50721	0.50000	0.60510	0.48774	0.77408	3.65605	0.00336	-0.00291	1.00000	0.425E+00	0.517E-02
	0.0580	C.0829	0.9552	-0.1566	-0.2512	3.0933	0.4362	0.9434	0.5000	-0.4283			
57	0.60000	C.0	0.16382	0.60000	0.43792	0.51936	0.00217	3.53574	-0.00166	0.00562	1.00000	-0.466E+01	0.845E+00
	0.2700	C.3959	0.9864	-0.1641	0.0011	3.1689	0.4362	0.6000	0.6000	-0.4960			
58	0.60000	C.10000	0.17209	0.60000	0.44360	0.52028	0.08674	3.52863	0.00041	0.00013	1.00000	0.441E+00	-0.359E-03
	0.2652	C.3923	0.9860	-0.1643	-0.0274	3.1644	0.4362	0.6083	0.6000	-0.4842			
59	0.60000	C.20000	0.19627	0.60000	0.45695	0.52662	0.17262	3.50911	0.00073	-0.00675	1.00000	0.319E+00	0.205E-01
	0.2460	C.3628	0.9844	-0.1668	-0.0569	3.1532	0.4362	0.6325	0.6000	-0.4783			
60	0.60000	C.30000	0.23464	0.60000	0.48472	0.53393	0.26695	3.87799	-0.00280	-0.00142	1.00000	0.420E+00	0.341E-04
	0.2146	C.3147	0.9815	-0.1711	-0.0856	3.1373	0.4362	0.6718	0.6000	-0.4694			
61	0.60000	C.40000	0.28493	0.60000	0.51468	0.54554	0.36025	3.83672	0.00091	-0.00620	1.00000	0.385E+00	0.101E-01
	0.1718	C.2503	0.9776	-0.1746	-0.1175	3.1191	0.4362	0.7211	0.6000	-0.4585			
62	0.60000	C.50000	0.34484	0.60000	0.54654	0.55619	0.46125	3.78746	0.00113	-0.00284	1.00000	0.418E+00	0.453E-02
	0.1169	C.1691	0.9724	-0.1785	-0.1456	3.1028	0.4362	0.7813	0.6000	-0.4478			
63	0.60000	C.60000	0.41234	0.60000	0.57702	0.56920	0.56413	3.73240	0.00390	-0.00356	1.00000	0.415E+00	0.785E-02

0.0485 C.0697 C.9658 -0.1828 -0.1837 3.0924 0.4362 0.8485 0.6000 -0.4375

64 0.60000 C.70000 0.48577 0.60000 0.60298 0.58142 0.67252 3.67387 0.00220-0.00533 1.00000 0.413E+00 0.675E-02
0.0347 C.0496 0.9575 -0.1873 -0.2192 3.0922 0.4362 0.9220 0.6000 -0.4296

65 0.70000 C.0 0.26382 0.70000 0.50243 0.62580 0.00174 3.85366-0.00102 0.00360 1.00000 -0.549E+01 0.122E+01
0.1914 C.2756 0.9754 -0.2018 -0.0006 3.1257 0.4362 0.7000 0.7000 -0.4633

66 0.70000 C.10000 0.27092 0.70000 0.50662 0.63197 0.08635 3.84832-0.00218-0.00831 1.00000 0.168E+00 0.535E-01
0.1837 C.2682 0.9787 -0.2030 -0.0303 3.1237 0.4362 0.7071 0.7000 -0.4617

67 0.70000 C.20000 0.29183 0.70000 0.51856 0.63665 0.17597 3.83108-0.00151-0.00420 1.00000 0.367E+00 0.131E-01
0.1656 C.2411 0.9779 -0.2047 -0.0591 3.1168 0.4362 0.7280 0.7000 -0.4575

68 0.70000 C.30000 0.32539 0.70000 0.53667 0.64429 0.27376 3.80364-0.00064-0.00459 1.00000 0.386E+00 0.100E-01
0.1346 C.1952 0.9741 -0.2075 -0.0896 3.1076 0.4362 0.7616 0.7000 -0.4511

69 0.70000 C.40000 0.37004 0.70000 0.55858 0.65362 0.37141 3.76727-0.00047-0.00376 1.00000 0.406E+00 0.609E-02
0.0909 C.1311 0.9699 -0.2111 -0.1211 3.0984 0.4362 0.8062 0.7000 -0.4436

70 0.70000 0.50000 0.42405 0.70000 0.58165 0.66462 0.47212 3.72308 0.00139-0.00297 1.00000 0.418E+00 0.553E-02
0.0355 C.0510 0.9646 -0.2145 -0.1537 3.0917 0.4362 0.8692 0.7000 -0.4360

71 0.70000 C.60000 0.48577 0.70000 0.60298 0.67769 0.57539 3.67386 0.00170-0.00600 1.00000 0.406E+00 0.868E-02
0.0347 C.0496 0.9575 -0.2186 -0.1880 3.0922 0.4362 0.9220 0.7000 -0.4296

72 0.70000 C.70000 0.55376 0.70000 0.61574 0.69011 0.68417 3.61973 0.00094-0.00626 1.00000 0.409E+00 0.719E-02
0.1149 C.1639 0.9492 -0.2222 -0.2226 3.1015 0.4362 0.9895 0.7000 -0.4266

73 0.80000 0.0 0.36382 0.80000 0.55875 0.74449 0.00178 3.77239-0.00250 0.00301 1.00000 -0.692E+01 0.182E+01
0.0970 C.1401 0.9705 -0.2410 0.0004 3.0994 0.4362 0.8000 0.8000 -0.4445

74 0.80000 C.10000 0.37004 0.80000 0.55858 0.74638 0.08588 3.76727-0.00156-0.00592 1.00000 0.251E+00 C.446E-01
0.0909 C.1311 0.9699 -0.2414 -0.0309 3.0984 0.4362 0.8062 0.8000 -0.4436

75 0.80000 C.20000 0.38844 0.80000 0.56687 0.75087 0.18479 3.75199 0.00327-0.00468 1.00000 0.362E+00 C.188E-01
0.0730 C.1052 0.9682 -0.2425 -0.0612 3.0953 0.4362 0.8246 0.8000 -0.4408

76 0.80000 C.30000 0.41822 0.80000 0.57535 0.75769 0.28159 3.72777 0.00085-0.00358 1.00000 0.399E+00 0.103E-01
0.0419 C.0602 0.9652 -0.2448 -0.0922 3.0921 0.4362 0.8544 0.8000 -0.4367

77 0.80000 C.40000 0.45824 0.80000 0.59416 0.76479 0.38054 3.69571 0.00327-0.00387 1.00000 0.406E+00 0.798E-02
0.0028 C.0040 0.9608 -0.2480 -0.1244 3.0910 0.4362 0.8944 0.8000 -0.4322

78 0.80000 C.50000 0.50721 0.80000 0.60509 0.77668 0.48359 3.65609 0.00051-0.00208 1.00000 0.424E+00 C.384E-02
0.0580 C.0828 0.9552 -0.2509 -0.1570 3.0933 0.4362 0.9434 0.8000 -0.4283

79 0.80000 C.60000 0.56381 0.80000 0.62164 0.78978 0.58715 3.61078 0.00225-0.00447 1.00000 0.414E+00 C.824E-02
0.1249 C.1780 0.9483 -0.2538 -0.1907 3.1027 0.4362 1.0000 0.8000 -0.4263

80 0.90000 C.0 0.46382 0.90000 0.59604 0.86261 0.00277 3.69091-0.00040 0.00352 1.00000 -0.969E+01 0.295E+01
0.0093 C.0118 0.9632 -0.2752 0.0004 3.0907 0.4362 0.9000 0.9000 -0.4317

81 0.90000 C.10000 0.46935 0.90000 0.59388 0.86469 0.08890 3.68703-0.00134-0.01019 1.00000 0.131E+00 0.877E-01
0.0160 0.0229 0.9594 -0.2801 -0.0321 3.0914 0.4362 0.9055 0.9000 -0.4312

82 0.90000 C.20000 0.48577 0.90000 0.61297 0.86857 0.18553 3.67387-0.00155-0.00509 1.00000 0.359E+00 0.212E-01
0.0347 C.0496 0.9575 -0.2814 -0.0629 3.0922 0.4362 0.9220 0.9000 -0.4298

83 0.90000 C.30000 0.51250 0.90000 0.61044 0.87494 0.28874 3.65245-0.00144-0.00426 1.00000 0.393E+00 C.113E-01
0.0656 C.0937 0.9544 -0.2832 -0.0947 3.0946 0.4362 0.9487 0.9000 -0.4281

84 0.90000 C.40000 0.54870 0.90000 0.61880 0.88361 0.38924 3.62402-0.00253-0.00536 1.00000 0.396E+00 C.952E-02
0.1094 C.1561 0.9498 -0.2858 -0.1273 3.1006 0.4362 0.9849 0.9000 -0.4267

85-0.10000 C.10000-0.29476-0.10000 0.04001-0.02787 0.02812 4.27035 0.01471-0.00538 1.00000 -0.139E+00 C.787E-02
0.4836 C.7652 0.9999 0.0121 -0.0195 3.5242 0.4362 0.1414 -0.1000 -0.5577

86-0.10000 C.20000-0.21258-0.10000 0.12648-0.05431 0.10961 4.22624 0.00952-0.00668 1.00000 0.238E+00 C.586E-02
0.4583 C.7175 C.9993 0.0185 -0.0337 3.4459 0.4362 0.2236 -0.1000 -0.5792

87-0.10000 C.30000-0.11906-0.10000 0.20713-0.06923 0.24593 4.18185 0.02413-0.00416 1.00000 0.371E+00 C.274E-02

```
    0.4252  0.6571  0.9978  0.0215 -0.0624  3.3640  0.4362  0.3162 -0.1000 -0.5573

88-0.10000 0.40000-0.02387-0.10000 0.29184-0.07596 0.39760 4.08773 0.00428-0.00029 1.00000  0.433E+00 0.420E-02
    0.3833  0.5841  0.9953  0.0244 -0.0937  3.2874  0.4362  0.4123 -0.1000 -0.5335

89-0.10000 0.50000 0.37372-0.10000 0.37143-0.08115 0.41255 4.03529 0.00435 0.00051 1.00000  0.440E+00 0.446E-02
    0.3302  0.4959  0.9914  0.0266 -0.1280  3.2299  0.4362  0.5095 -0.1000 -0.5085

90-0.10000 0.60000 0.17209-0.10000 0.44359-0.08512 0.52055 3.92863 0.00430 0.00109 1.00000  0.443E+00 0.418E-02
    0.2652  0.3924  0.9860  0.0282 -0.1642  3.1644  0.4362  0.6083 -0.1000 -0.4842

91-0.10000 0.70000 0.27092-0.10000 0.51663-0.08810 0.63173 3.84831 0.00476-0.00266 1.00000  0.423E+00 0.437E-02
    0.1837  0.2682  0.9787  0.0297 -0.2021  3.1237  0.4362  0.7071 -0.1000 -0.4617

92-0.10000 0.80000 0.37004-0.10000 0.55858-0.09104 0.74624 3.76727 0.00398-0.00179 1.00000  0.429E+00 0.375E-02
    0.0909  0.1311  0.9699  0.0307 -0.2414  3.0984  0.4362  0.8062 -0.1000 -0.4436

93-0.10000 0.90000 0.46935-0.10000 0.59788-0.09367 0.86419 3.68702 0.00351-0.00202 1.00000  0.425E+00 0.328E-02
    0.0159  0.0228  0.9594  0.0314 -0.2832  3.0914  0.4362  0.9055 -0.1000 -0.4312

94-0.20000 0.0     -0.23618-0.20000 0.09770-0.09844 0.00036 4.24076 0.01524 0.00549 1.00000 -0.327E+01-0.106E+00
    0.4646  0.7293  0.9995  0.0329  0.0015  3.4683  0.4362  0.2000 -0.2000 -0.5835

95-0.20000 0.10000-0.21258-0.20000 0.12046-0.10921 0.05509 4.22611 0.00813 0.00150 1.00000  0.559E+00 0.123E-01
    0.4598  0.7201  0.9993  0.0341 -0.0154  3.4458  0.4362  0.2236 -0.2000 -0.5795

96-0.20000 0.20000-0.15334-0.20000 0.17644-0.12891 0.12939 4.18596 0.00414-0.00020 1.00000  0.431E+00 0.353E-02
    0.4394  0.6826  0.9985  0.0352 -0.0382  3.3925  0.4362  0.2828 -0.2000 -0.5661

97-0.20000 0.30000-0.07563-0.20000 0.24692-0.14513 0.21908 4.12814 0.00441 0.00101 1.00000  0.452E+00 0.510E-02
    0.4076  0.6261  0.9968  0.0449 -0.0655  3.3274  0.4362  0.3606 -0.2000 -0.5467

98-0.20000 0.40000 0.01103-0.20000 0.32110-0.15752 0.31662 4.06009 0.00370-0.00112 1.00000  0.425E+00 0.313E-02
    0.3646  0.5527  0.9940  0.0494 -0.0974  3.2622  0.4362  0.4472 -0.2000 -0.5242

99-0.20000 0.50000 0.10233-0.20000 0.39328-0.16597 0.41573 3.98578 0.00517 0.00243 1.00000  0.455E+00 0.617E-02
    0.3128  0.4677  0.9900  0.0534 -0.1303  3.2024  0.4362  0.5385 -0.2000 -0.5014

100-0.20000 0.60000 0.19627-0.20000 0.45595-0.17359 0.52630 3.90911 0.00442-0.00003 1.00000  0.436E+00 0.441E-02
    0.2460  0.3628  0.9844  0.0565 -0.1669  3.1532  0.4362  0.6325 -0.2000 -0.4783

101-0.20000 0.70000 0.25183-0.20000 0.51857-0.17956 0.63677 3.83108 0.00495-0.00128 1.00000  0.430E+00 0.462E-02
    0.1656  0.2411  0.9770  0.0592 -0.2047  3.1168  0.4362  0.7280 -0.2000 -0.4575

102-0.20000 0.80000 0.30844-0.20000 0.56688-0.18473 0.75089 3.75199 0.00477 0.00030 1.00000  0.437E+00 0.484E-02
    0.0730  0.1052  0.9682  0.0612 -0.2425  3.0953  0.4362  0.8246 -0.2000 -0.4408

103-0.20000 0.90000 0.48577-0.20000 0.60297-0.19032 0.86846 3.67387 0.00441-0.00169 1.00000  0.430E+00 0.403E-02
    0.0347  0.0496  0.9575  0.0629 -0.2814  3.0922  0.4362  0.9220 -0.2000 -0.4298

104-0.30000 0.0     -0.13618-0.30000 0.19220-0.20024 0.00097 4.17358 0.00301 0.00707 1.00000 -0.347E+01-0.232E+00
    0.4326  0.6704  0.9982  0.0602  0.0018  3.3776  0.4362  0.3000 -0.3000 -0.5618

105-0.30000 0.10000-0.11596-0.30000 0.20713-0.20566 0.06502 4.16185 0.00582 0.00116 1.00000  0.494E+00 0.945E-02
    0.4252  0.6571  0.9978  0.0629 -0.0202  3.3640  0.4362  0.3162 -0.3000 -0.5573

106-0.30000 0.20000-0.07563-0.30000 0.24692-0.21915 0.14653 4.12814 0.00410 0.00326 1.00000  0.512E+00 0.916E-02
    0.4076  0.6261  0.9968  0.0668 -0.0431  3.3274  0.4362  0.3606 -0.3000 -0.5467

107-0.30000 0.30000-0.01192-0.30000 0.33138-0.23202 0.23383 4.07840 0.00588 0.00190 1.00000  0.463E+00 0.782E-02
    0.3765  0.5727  0.9943  0.0726 -0.0707  3.2787  0.4362  0.4243 -0.3000 -0.5301

108-0.30000 0.40000 0.06382-0.30000 0.36367-0.24479 0.32871 4.01757 0.00555 0.00045 1.00000  0.441E+00 0.585E-02
    0.3347  0.5033  0.9918  0.0776 -0.1017  3.2267  0.4362  0.5000 -0.3000 -0.5107

109-0.30000 0.50000 0.14691-0.30000 0.42596-0.25612 0.42521 3.94569 0.00385-0.00017 1.00000  0.435E+00 0.379E-02
    0.2816  0.4183  0.9874  0.0818 -0.1351  3.1778  0.4362  0.5831 -0.3000 -0.4900

110-0.30000 0.60000 0.23464-0.30000 0.48472-0.26696 0.53392 3.87799 0.00147-0.00280 1.00000  0.420E+00-0.119E-05
    0.2146  0.3147  0.9815  0.0855 -0.1711  3.1379  0.4362  0.6708 -0.3000 -0.4654

111-0.30000 0.70000 0.32539-0.30000 0.53668-0.27310 .64457 3.80363 0.00575-0.03013 1.00000  0.436E+00 0.573E-02
```

```
     0.1346  0.1952  0.9741  0.0857 -0.2078  3.1076  0.4362  0.7616 -0.3000 -0.4511

112-0.30000 0.80000 0.41822-0.30000 0.57540-0.28137 0.75777 3.72776 0.00392 0.00098 1.00000  0.440E+00 0.429E-02
     0.0419  0.0602  0.9652  0.0923 -0.2448  3.0921  0.4362  0.8544 -0.3000 -0.4367

113-0.30000 0.90000 0.51250-0.30000 0.61044-0.28865 0.87497 3.65245 0.00439-0.00141 1.00000  0.431E+00 0.351E-02
     0.0656  0.0937  0.9544  0.0947 -0.2832  3.0946  0.4362  0.9487 -0.3000 -0.4281

114-0.40000 0.0    -0.03618-0.40000 0.28135-0.30392 0.00091 4.09772 0.00462 0.00428 1.00000 -0.374E+01-0.388E+00
     0.3878  0.5919  0.9956  0.0936  0.0919  3.2969  0.4362  0.4000 -0.4000 -0.5361

115-0.40000 0.10000-0.02387-0.40000 0.29185-0.30699 0.07843 4.08773 0.00307 0.00679 1.00000  0.146E+00 0.324E-01
     0.3833  0.5841  0.9953  0.0943 -0.0218  3.2874  0.4362  0.4123 -0.4000 -0.5335

116-0.40000 0.20000 0.01103-0.40000 0.32110-0.31597 0.15883 4.06009 0.00372 0.00150 1.00000  0.467E+00 0.678E-02
     0.3645  0.5527  0.9940  0.0980 -0.0482  3.2622  0.4362  0.4472 -0.4000 -0.5242

117-0.40000 0.30000 0.06382-0.40000 0.36367-0.32695 0.24713 4.01758 0.00548 0.00234 1.00000  0.467E+00 0.866E-02
     0.3347  0.5033  0.9918  0.1030 -0.0759  3.2267  0.4362  0.5000 -0.4000 -0.5107

118-0.40000 0.40000 0.12550-0.40000 0.41340-0.33806 0.34119 3.96364 0.00332 0.01307 1.00000  0.464E+00 0.636E-02
     0.2947  0.4388  0.9885  0.1074 -0.1061  3.1869  0.4362  0.5657 -0.4000 -0.4945

119-0.40000 0.50000 0.20413-0.40000 0.46516-0.35013 0.44084 3.90272 0.00485 0.00166 1.00000  0.448E+00 0.623E-02
     0.2398  0.3531  0.9838  0.1127 -0.1354  3.1497  0.4362  0.6403 -0.4000 -0.4764

120-0.40000 0.60000 0.28493-0.40000 0.51468-0.36052 0.54535 3.83673 0.00566 0.00055 1.00000  0.435E+00 0.603E-02
     0.1718  0.2503  0.9776  0.1174 -0.1747  3.1100  0.4362  0.7211 -0.4000 -0.4589

121-0.40000 0.70000 0.37004-0.40000 0.55859-0.37053 0.65412 3.76727 0.00524 0.00038 1.00000  0.438E+00 0.545E-02
     0.0909  0.1311  0.9699  0.1213 -0.2110  3.0984  0.4362  0.8062 -0.4000 -0.4436

122-0.40000 0.80000 0.45824-0.40000 0.59417-0.37993 0.76709 3.69571 0.00475 0.00070 1.00000  0.439E+00 0.510E-02
     0.0030  0.0043  0.9608  0.1245 -0.2479  3.0910  0.4362  0.8934 -0.4000 -0.4322

123-0.40000 0.90000 0.54870-0.40000 0.61881-0.38871 0.88384 3.62402 0.00601-0.00224 1.00000  0.429E+00 0.501E-02
     0.1094  0.1561  0.9498  0.1273 -0.2858  3.1006  0.4362  0.9849 -0.4000 -0.4267

124-0.50000 0.0    -0.06382-0.50000 0.36367-0.40384 0.00169 4.01756 0.00390 0.00571 1.00000 -0.411E+01-0.584E+00
     0.3347  0.5033  0.9919  0.1279  0.0112  3.2266  0.4362  0.5000 -0.5000 -0.5107

125-0.50000 0.10000 0.07372-0.50000 0.37144-0.41184 0.08470 4.00919 0.00183 0.00730 1.00000  0.737E+00 0.409E-01
     0.3302  0.4959  0.9914  0.1285 -0.0240  3.2200  0.4362  0.5096 -0.5003 -0.5085

126-0.50000 0.20000 0.10233-0.50000 0.39327-0.41858 0.16873 3.98578 0.00104 0.00351 1.00000  0.504E+00 0.997E-02
     0.3128  0.4677  0.9903  0.1310 -0.0516  3.2025  0.4362  0.5385 -0.5000 -0.5014

127-0.50000 0.30000 0.14691-0.50000 0.42596-0.42772 0.25858 3.94666 0.00417 0.00275 1.00000  0.470E+00 0.881E-02
     0.2816  0.4183  0.9874  0.1359 -0.0805  3.1778  0.4362  0.5831 -0.5000 -0.4909

128-0.50000 0.40000 0.20413-0.50000 0.46517-0.43823 0.35329 3.90273 0.00445 0.00279 1.00000  0.461E+00 0.801E-02
     0.2398  0.3531  0.9838  0.1406 -0.1113  3.1497  0.4362  0.6403 -0.5000 -0.4764

129-0.50000 0.50000 0.27092-0.50000 0.50663-0.44910 0.45294 3.84831 0.00624 0.00157 1.00000  0.447E+00 0.782E-02
     0.1837  0.2682  0.9787  0.1458 -0.1445  3.1237  0.4362  0.7071 -0.5000 -0.4617

130-0.50000 0.60000 0.34484-0.50000 0.54655-0.46312 0.55711 3.78745 0.00501 0.00293 1.00000  0.452E+00 0.747E-02
     0.1169  0.1691  0.9724  0.1499 -0.1786  3.1028  0.4362  0.7810 -0.5000 -0.4478

131-0.50000 0.70000 0.42405-0.50000 0.58166-0.47081 0.66555 3.72307 0.00495 0.00289 1.00000  0.449E+00 0.696E-02
     0.0355  0.0510  0.9646  0.1539 -0.2144  3.0917  0.4362  0.8602 -0.5000 -0.4369

132-0.50000 0.80000 0.53721-0.50000 0.60510-0.48217 0.77763 3.65615 0.00419 0.00175 1.00000  0.443E+00 0.518E-02
     0.0580  0.0829  0.9552  0.1572 -0.2508  3.0933  0.4362  0.9434 -0.5000 -0.4283

133-0.60000 0.0    0.16302-0.60000 0.43782-0.51836 0.00217 3.93574 0.00166 0.00562 1.00000 -0.466E+01-0.845E+00
     0.2700  0.3999  0.9864  0.1641 -0.0911  3.1699  0.4362  0.6000 -0.6000 -0.4860

134-0.60000 0.10000 0.17219-0.60000 0.44361-0.52028 0.08674 3.92863-0.00441 0.00013 1.00000  0.441E+00 0.359E-03
     0.2652  0.3924  0.9860  0.1643 -0.1274  3.1644  0.4362  0.6083 -0.6000 -0.4842

135-0.60000 0.20000 0.19627-0.60000 0.45595-0.52407 0.17787 3.90511 0.00344 0.00582 1.00000  0.541E+00 0.213E-01
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    0.2460   C.3628   C.9844   C.1676 -0.0546   3.1532   0.4362   0.6325 -0.6000 -0.4783

136-0.60000 C.30000 0.23464-0.60000 0.48472-0.53393 0.26695 3.87799 0.00280-0.00142 1.00000  0.420E+00-C.341E-04
    0.2146   C.3147   C.9815   0.1711 -0.0856   3.1370   0.4362   0.6718 -0.6000 -0.4694

137-0.60000 C.40000 0.28493-0.60000 0.51468-0.54236 0.36502 3.83672 0.00538 0.00323 1.00000  0.463E+00 C.103E-01
    0.1718   C.2503   C.9776   0.1756 -0.1160   3.1190   0.4362   0.7211 -0.6000 -0.4589

138-0.60000 C.50000 0.34484-0.60000 0.54654-0.55397 0.46379 3.78746 0.00255 0.00162 1.00000  0.447E+00 C.454E-02
    0.1169   C.1691   C.9724   0.1754 -0.1490   3.1028   0.4362   0.7810 -0.6000 -0.4478

139-0.60000 C.60000 0.41234-0.60000 0.57702-0.56413 0.56920 3.73240 0.00396 0.00350 1.00000  0.457E+00 C.788E-02
    0.0485   C.0697   C.9659   0.1837 -0.1828   3.0924   0.4362   0.8485 -0.6000 -0.4375

140-0.60000 C.70000 0.48577-0.60000 0.60298-0.57568 0.67744 3.67387 0.00561 0.00176 1.00000  0.442E+00 C.678E-02
    0.0347   C.0496   C.9575   0.1880 -0.2186   3.0922   0.4362   0.9220 -0.6000 -0.4298

141-C.70000 C.0      0.26382-0.70000 0.57243-0.62080 0.00174 3.85366 0.00103 0.00360 1.00000 -0.549E+01-C.122E+01
    0.1914   C.2796   C.9794   0.2018   0.0306   3.1257   0.4362   0.7000 -0.7000 -0.4633

142-C.70000 C.10000 0.27092-0.70000 0.59662-0.63089 0.09393 3.84822 0.00438 0.00711 1.00000  0.687E+00 C.564E-01
    0.1837   C.2682   C.9787   0.2034 -0.0278   3.1237   0.4362   0.7071 -0.7000 -0.4617

143-C.70000 C.20000 0.29183-0.70000 0.51856-0.63563 0.18354 3.83108 0.00350 0.00276 1.00000  0.483E+00 C.133E-01
    0.1656   C.2411   C.9773   0.2051 -0.0580   3.1168   0.4362   0.7280 -0.7000 -0.4575

144-C.70000 C.30000 0.32539-0.70000 0.53667-0.64258 0.27776 3.80364 0.00376 0.00270 1.00000  0.466E+00 C.101E-01
    0.1346   C.1952   C.9741   0.2080 -0.0885   3.1176   0.4362   0.7616 -0.7000 -0.4511

145-C.70000 C.40000 C.37004-0.70000 0.55858-0.65182 0.37456 3.76727 0.00348 0.00151 1.00000  0.448E+00 C.612E-02
    C.0909   C.1311   C.9659   0.2115 -0.1204   3.0984   0.4362   0.8062 -0.7000 -0.4436

146-C.70000 C.50000 0.42405-0.70000 0.58165-0.66215 0.47557 3.72308 0.00236 0.00227 1.00000  0.451E+00 C.555E-02
    0.0555   C.0510   C.9646   0.2149 -0.1531   3.0917   0.4362   0.8602 -0.7000 -0.4360

147-C.70000 C.60000 0.48577-0.70000 0.60298-0.67227 0.58172 3.67387 0.00567 0.00260 1.00000  0.449E+00 C.872E-02
    0.0347   C.0496   C.9575   0.2192 -0.1873   3.0922   0.4362   0.9220 -0.7000 -0.4298

148-C.70000 C.70000 0.55376-0.70000 0.61974-0.68417 0.69011 3.61977 0.00626 0.00054 1.00000  0.440E+00 C.720E-02
    0.0149   C.0135   C.9492   0.2226 -0.2222   3.1015   0.4362   0.9896 -0.7000 -0.4266

149-C.80000 C.0      0.36382-0.80000 0.55575-0.74449 0.00178 3.77239 0.00250 0.00301 1.00000 -0.692E+01-C.182E+01
    0.0970   C.1401   C.9705   0.2410   0.0304   3.0994   0.4362   0.8030 -0.8000 -0.4445

150-C.80000 C.10000 0.37004-0.80000 0.55858-0.74555 0.09654 3.76727 0.00295 0.00523 1.00000  0.608E+00 C.458E-01
    0.0909   C.1311   C.9659   0.2416 -0.2255   3.0984   0.4362   0.8062 -0.8000 -0.4436

151-C.80000 C.20000 0.38844-0.80000 0.56687-0.74959 0.19039 3.75199 0.00196 0.00425 1.00000  0.505E+00 0.191E-01
    0.0730   C.1052   C.9682   0.2428 -0.2601   3.0953   0.4362   0.8246 -0.8000 -0.4408

152-C.80000 C.30000 0.41822-0.80000 0.57939-0.75612 0.28604 3.72777 0.00171 0.00324 1.00000  0.470E+00 C.104E-01
    0.0419   0.0602   C.9652   C.2451 -0.0915   3.0921   0.4362   0.8544 -0.8000 -0.4367

153-C.80000 0.40000 0.45824-0.80000 0.59416-0.76445 0.38503 3.69571 0.00293 0.00253 1.00000  0.456E+00 0.802E-02
    0.0028   C.0040   C.9608   0.2483 -0.1237   3.0913   0.4362   0.8944 -0.8000 -0.4322

154-0.80000 C.50000 0.50721-0.80000 0.60599-0.77533 0.48623 3.65609 0.00165 0.00137 1.00000  0.445E+00 0.385E-02
    0.0580   C.0828   C.9552   0.2511 -0.1567   3.0933   0.4362   0.9434 -0.8000 -0.4283

155-C.80000 C.60000 0.56391-0.80000 0.62164-0.78481 0.59378 3.61078 0.00365 0.00345 1.00000  0.453E+00 C.876E-02
    0.1248   C.1780   C.9483   0.2541 -0.1903   3.1027   0.4362   1.0000 -0.8000 -0.4263

156-C.80000 C.0      0.46382-0.90000 0.59604-0.86261 0.00277 3.69091 0.00340 0.00392 1.00000 -0.969E+01-0.295E+01
    0.0083   C.0118   C.9602   0.2792   0.1304   3.0907   0.4362   0.9010 -0.9000 -0.4317

157-C.90000 C.10000 0.46935-0.90000 0.59788-0.86317 0.10265 3.68703 0.00347 0.00365 1.00000  0.723E+00 C.872E-01
    0.0160   C.0229   C.9554   0.2803 -0.1303   3.0914   0.4362   0.9055 -0.9000 -0.4312

158-C.90000 C.20000 0.48577-0.90000 0.60297-0.86710 0.19615 3.67387 0.00355 0.00351 1.00000  0.496E+00 C.213E-01
    0.0347   0.0496   C.9575   0.2816 -0.0622   3.0922   0.4362   0.9220 -0.9000 -0.4298

159-0.90000 C.30000 C.51250-C.90000 0.61044-0.87320 0.29398 3.65245 C.30371 0.00255 1.00000  0.462E+00 C.114E-01
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0.0656 0.0937 0.9544 0.2834 -0.0942 3.0946 0.4362 0.9487 -0.9000 -0.4281

160-0.50000 0.40000 0.54870-0.90000 0.61880-0.88103 0.39504 3.62402 0.00567 0.00172 1.00000 0.449E+00 0.955E-02
0.1094 0.1561 0.9458 0.2860 -0.1269 3.1006 0.4362 0.9849 -0.9000 -0.4267

IMIRROR IMAGE SKEW RAYS FOLLOW

IMAGE RAY	RAY	RAYY	RAYZ	OPL	YIM	ZIP	NTNCTY	XDIAPT YDIAPT
161	1	0.0	-0.2000000	4.24078274	0.0054853	0.0164587	1.0000000	-0.603E-01 0.475E-02
162	2	0.0	-0.3000001	4.17357540	0.0031923	0.0031132	1.0000000	0.395E+00 0.315E-02
163	3	0.0	-0.4000001	4.09772682	0.0028000	0.0046203	1.0000000	0.387E+00 0.277E-02
164	4	0.0	-0.5000001	4.01756477	0.0039502	0.0029974	1.0000000	0.413E+00 0.393E-02
165	5	0.0	-0.6000001	3.93575191	0.0043350	0.0016529	1.0000000	0.426E+00 0.433E-02
166	6	0.0	-0.7000002	3.85365105	0.0044867	0.0010263	1.0000000	0.431E+00 0.448E-02
167	7	0.0	-0.8000002	3.77238750	0.0036257	0.0024981	1.0000000	0.426E+00 0.362E-02
168	8	0.0	-0.9000002	3.69091415	0.0039220	0.0003997	1.0000000	0.435E+00 0.392E-02
169	9	0.1000000	-0.1000000	4.27035427	-0.0053825	0.0147110	1.0000000	-0.781E+00 0.619E-02
170	10	0.1000000	-0.2000000	4.22624493	0.0003680	0.0116265	1.0000000	0.105E+00 0.564E-02
171	11	0.1000000	-0.3000001	4.16185284	0.0008731	0.0057240	1.0000000	0.345E+00 0.272E-02
172	12	0.1000000	-0.4000001	4.08772659	0.0036370	0.0022712	1.0000000	0.412E+00 0.418E-02
173	13	0.1000000	-0.5000001	4.00919724	0.0042109	0.0012001	1.0000000	0.427E+00 0.444E-02
174	14	0.1000000	-0.6000001	3.92863178	0.0041304	0.0002688	1.0000000	0.435E+00 0.417E-02
175	15	0.1000000	-0.7000002	3.84831238	0.0038219	0.0038793	1.0000000	0.418E+00 0.436E-02
176	16	0.1000000	-0.8000002	3.76727295	0.0034146	0.0027167	1.0000000	0.425E+00 0.375E-02
177	17	0.1000000	-0.9000002	3.68702126	0.0029792	0.0023367	1.0000000	0.427E+00 0.378E-02
178	18	0.2000000	-0.1000000	4.22610664	-0.0133557	0.0076477	1.0000000	0.112E-01 0.106E-01
179	20	0.2000000	-0.2000000	4.18595886	-0.0102034	0.0041443	1.0000000	0.331E+00 0.483E-02
180	21	0.2000000	-0.3000001	4.12814045	-0.0126273	0.0036802	1.0000000	0.381E+00 0.501E-02

181	22	0.2000000-0.4000001	4.06009197	0.0013279	0.0036302	1.0000000	0.399E+00 0.312E-02
182	23	0.2000000-0.5000001	3.98577595	0.0054189	0.0018111	1.0000000	0.423E+00 0.613E-02
183	24	0.2000000-0.6000001	3.90910721	0.0035214	0.0026788	1.0000000	0.420E+00 0.440E-02
184	25	0.2000000-0.7000002	3.83107567	0.0035610	0.0037240	1.0000000	0.418E+00 0.461E-02
185	26	0.2000000-0.8000002	3.75158841	0.0043493	0.0015773	1.0000000	0.428E+00 0.484E-02
186	27	0.2000000-0.9000002	3.67387295	0.0032785	0.0034030	1.0000000	0.425E+00 0.403E-02
187	28	0.3000001-0.1000000	4.16185093	-0.0039618	0.0044041	1.0000000	0.233E+00 0.877E-02
188	30	0.3000001-0.2000000	4.12813854	0.0014287	0.0050400	1.0000000	0.325E+00 0.874E-02
189	31	0.3000001-0.3000001	4.07840347	0.0018931	0.0058762	1.0000000	0.356E+00 0.763E-02
190	32	0.3000001-0.4000001	4.01757240	0.0019837	0.0052012	1.0000000	0.386E+00 0.582E-02
191	33	0.3000001-0.5000001	3.94968891	0.0016769	0.0035137	1.0000000	0.411E+00 0.377E-02
192	34	0.3000001-0.6000001	3.87759168	-0.0014308	0.0028040	1.0000000	0.420E+00 0.119E-05
193	35	0.3000001-0.7000002	3.80363274	0.0038987	0.0042735	1.0000000	0.416E+00 0.572E-02
194	36	0.3000001-0.8000002	3.72776127	0.0035962	0.0018350	1.0000000	0.429E+00 0.428E-02
195	37	0.3000001-0.9000002	3.65244675	0.0026599	0.0037535	1.0000000	0.424E+00 0.391E-02
196	39	0.4000001-0.1000000	4.08772755	0.0105001	0.0074829	1.0000000	0.140E+00 0.283E-01
197	40	0.4000001-0.2000000	4.06006530	-0.0110338	0.0038719	1.0000000	0.358E+00 0.659E-02
198	41	0.4000001-0.3000001	4.01757717	0.0107155	0.0059121	1.0000000	0.361E+00 0.846E-02
199	42	0.4000001-0.4000001	3.96364498	0.0030038	0.0033162	1.0000000	0.406E+00 0.628E-02
200	43	0.4000001-0.5000001	3.90272331	0.0026956	0.0044063	1.0000000	0.405E+00 0.618E-02
201	44	0.4000001-0.6000001	3.83672819	0.0026858	0.0050118	1.0000000	0.408E+00 0.600E-02
202	45	0.4000001-0.7000002	3.76726542	0.0029799	0.0043193	1.0000000	0.416E+00 0.543E-02
203	46	0.4000001-0.8000002	3.69570827	0.0034177	0.0033785	1.0000000	0.423E+00 0.509E-02
204	47	0.4000001-0.9000002	3.62401772	0.0123645	0.0059649	1.0000000	0.416E+00 0.501E-02

205	49	0.50C0001-0.1000000	4.00919342	0.0011327	0.0075034	1.0000000	0.163E+00 0.363E-01
206	50	0.50C0001-0.2000000	3.98578453	0.0016674	0.0032668	1.0000000	0.375E+00 0.971E-02
207	51	0.50C0001-0.3000001	3.94968987	0.0004574	0.0049669	1.0000000	0.376E+00 0.863E-02
208	52	0.50C0001-0.4000001	3.90272522	0.0017331	0.0049861	1.0000000	0.393E+00 0.790E-02
209	53	0.50C0001-0.5000001	3.84830856	0.0015668	0.0062363	1.0000000	0.354E+00 0.775E-02
210	54	0.50C0001-0.6000001	3.78745365	0.0037896	0.0043965	1.0000000	0.412E+00 0.743E-02
211	55	0.50C0001-0.7000002	3.72307014	0.0042595	0.0037777	1.0000000	0.419E+00 0.694E-02
212	56	0.50C0001-0.8000002	3.65608788	0.0033600	0.0029077	1.0000000	0.425E+00 0.517E-02
213	58	0.60C0001-0.1000000	3.92862511	0.0004095	-0.0001280	1.0000000	0.441E+00 -0.359E-03
214	59	0.60C0001-0.2000000	3.90910721	0.0007309	0.0067502	1.0000000	0.319E+00 0.205E-01
215	60	0.6000001-0.3000001	3.87799454	-0.0028021	0.0014182	1.0000000	0.429E+00 0.341E-04
216	61	0.60C0001-0.4000001	3.83672237	0.0009093	0.0062014	1.0000000	0.385E+00 0.101E-01
217	62	0.60C0001-0.5000001	3.78746128	0.0011321	0.0028399	1.0000000	0.418E+00 0.453E-02
218	63	0.60C0001-0.6000001	3.73239708	0.0039017	0.0035634	1.0000000	0.415E+00 0.785E-02
219	64	0.60C0001-0.7000002	3.67366723	0.0022002	0.0053794	1.0000000	0.413E+00 0.675E-02
220	66	0.70C0002-0.1000000	3.84832956	-0.0021794	0.0083067	1.0000000	0.168E+00 0.535E-01
221	67	0.70C0002-0.2000000	3.83107758	-0.0015110	0.0042030	1.0000000	0.367E+00 0.131E-01
222	68	0.70C0002-0.3000001	3.80363560	-0.0006354	0.0045882	1.0000000	0.386E+00 0.100E-01
223	69	0.70C0002-0.4000001	3.76727200	-0.0004658	0.0037591	1.0000000	0.406E+00 0.669E-02
224	70	0.70C0002-0.5000001	3.72307587	0.0013972	0.0029685	1.0000000	0.418E+00 0.553E-02
225	71	0.70C0002-0.6000001	3.67386246	0.0017003	0.0060047	1.0000000	0.406E+00 0.868E-02
226	72	0.70C0002-0.7000002	3.61972523	0.0009379	0.0062600	1.0000000	0.409E+00 0.719E-02
227	74	0.80C0002-0.1000000	3.76727200	-0.0015622	0.0055179	1.0000000	0.251E+00 0.446E-01
228	75	0.80C0002-0.2000000	3.75155127	0.0002749	0.0046778	1.0000000	0.362E+00 0.188E-01

229	7E 0.8CC0002-0.3000001	3.72776508	0.0008479	0.0035773	1.0000000	0.399E+00 0.103E-01
230	7F 0.8CC0002-0.4000001	3.69571318	0.0002673	0.0038715	1.0000000	0.406E+00 0.798E-02
231	7E 0.8CC0CD2-0.5000001	3.65608978	0.0005394	0.0020849	1.0000000	0.424E+00 0.384E-02
232	7F 0.8CC0002-0.6000001	3.61078167	0.0022855	0.0044706	1.0000000	0.414E+00 0.824E-02
233	E1 0.9CC0002-0.1000000	3.68702984	-0.0013421	0.0101870	1.0000000	0.131E+00 0.877E-01
234	E2 0.9CC0C02-0.2000000	3.67387295	-0.0015483	0.0050860	1.0000000	0.359E+00 0.212E-01
235	E3 0.9CC0C02-0.3000001	3.65244961	-0.0014436	0.0042624	1.0000000	0.393E+00 0.113E-01
236	E4 0.9CC0002-0.4000001	3.62401962	-0.0025264	0.0053644	1.0000000	0.396E+00 0.952E-02
237	E5-0.1CC0000-0.1000000	4.27035427	0.0147112	0.0053823	1.0000000	-0.130E+00 0.787E-02
238	E6-0.10C0000-0.2000000	4.22624493	0.0095235	0.0066810	1.0000000	0.238E+00 0.586E-02
239	E7-0.10C0C00-0.3000001	4.16185284	0.0041337	0.0040550	1.0000000	0.371E+00 0.274E-02
240	E8-0.10C0000-0.4000001	4.08772659	0.0042783	0.0002921	1.0000000	0.433E+00 0.420E-02
241	E9-0.10C0000-0.5000001	4.00919724	0.0043494	-0.0005121	1.0000000	0.440E+00 0.446E-02
242	EC-0.10C0000-0.6000001	3.92863178	0.0039951	-0.0010854	1.0000000	0.443E+00 0.418E-02
243	F1-0.10C0000-0.7000002	3.84831238	0.0047560	0.0026555	1.0000000	0.423E+00 0.437E-02
244	F2-0.10C0000-0.8000002	3.76727295	0.0039786	0.0017930	1.0000000	0.429E+00 0.375E-02
245	F3-0.10C0000-0.9000002	3.68702126	0.0035077	0.0020164	1.0000000	0.425E+00 0.328E-02
246	F5-0.20C0000-0.1000000	4.22610664	0.0081304	-0.0019015	1.0000000	0.559E+00 0.123E-01
247	F6-0.20C0000-0.2000000	4.18555886	0.0041428	0.0002035	1.0000000	0.431E+00 0.393E-02
248	F7-0.20C0000-0.3000001	4.12814045	0.0044076	-0.0010101	1.0000000	0.452E+00 0.510E-02
249	F8-0.20C0000-0.4000001	4.06009197	0.0037007	0.0011150	1.0000000	0.425E+00 0.313E-02
250	F9-0.20C0000-0.5000001	3.98577881	0.0051745	-0.0024257	1.0000000	0.455E+00 0.617E-02
251	10C-0.20C0000-0.6000001	3.90910721	0.0044245	0.0000304	1.0000000	0.436E+00 0.441E-02
252	101-0.20C0000-0.7000002	3.83107567	0.0040914	0.0012819	1.0000000	0.430E+00 0.462E-02

253	102-0.2000000-0.8000002	3.75158841	0.0047681	-0.0003018	1.0000000	0.437E+00 0.484E-02
254	103-0.2000000-0.9000002	3.67387295	0.0044110	0.0016944	1.0000000	0.430E+00 0.403E-02
255	105-0.3000001-0.1000000	4.16185093	0.0059174	-0.0011642	1.0000000	0.494E+00 0.945E-02
256	106-0.3000001-0.2000000	4.12813854	0.0041028	-0.0032583	1.0000000	0.512E+00 0.916E-02
257	107-0.3000001-0.3000001	4.07840347	0.0058767	-0.0018986	1.0000000	0.463E+00 0.782E-02
258	108-0.3000001-0.4000001	4.01757249	0.0055481	-0.0004456	1.0000000	0.441E+00 0.589E-02
259	109-0.3000001-0.5000001	3.94568987	0.0038897	0.0001729	1.0000000	0.435E+00 0.379E-02
260	110-0.3000001-0.6000001	3.87759168	0.0014038	0.0028040	1.0000000	0.420E+00 -0.119E-05
261	111-0.3000001-0.7000002	3.80363274	0.0057877	0.0001283	1.0000000	0.436E+00 0.573E-02
262	112-0.3000001-0.8000002	3.72776127	0.0039158	-0.0009817	1.0000000	0.440E+00 0.429E-02
263	113-0.3000001-0.9000002	3.65244675	0.0043796	0.0014074	1.0000000	0.431E+00 0.391E-02
264	115-0.4000001-0.1000000	4.08772755	0.0030699	-0.0067881	1.0000000	0.746E+00 0.324E-01
265	116-0.4000001-0.2000000	4.06008539	0.0037223	-0.0015037	1.0000000	0.467E+00 0.678E-02
266	117-0.4000001-0.3000001	4.01757717	0.0054762	-0.0023428	1.0000000	0.467E+00 0.866E-02
267	118-0.4000001-0.4000001	3.96364498	0.0033165	-0.0030042	1.0000000	0.464E+00 0.636E-02
268	119-0.4000001-0.5000001	3.90272331	0.0048903	-0.0016623	1.0000000	0.448E+00 0.623E-02
269	120-0.4000001-0.6000001	3.83672810	0.0056588	-0.0005514	1.0000000	0.439E+00 0.603E-02
270	121-0.4000001-0.7000002	3.76726532	0.0052356	-0.0003752	1.0000000	0.438E+00 0.545E-02
271	122-0.4000001-0.8000002	3.69570827	0.0047471	-0.0006989	1.0000000	0.439E+00 0.510E-02
272	123-0.4000001-0.9000002	3.62401772	0.0060118	0.0022422	1.0000000	0.429E+00 0.501E-02
273	125-0.5000001-0.1000000	4.00919342	0.0018274	-0.0073021	1.0000000	0.737E+00 0.469E-01
274	126-0.5000001-0.2000000	3.98578453	0.0010449	-0.0035129	1.0000000	0.504E+00 0.957E-02
275	127-0.5000001-0.3000001	3.94968997	0.0041708	-0.0027468	1.0000000	0.470E+00 0.881E-02
276	128-0.5000001-0.4000001	3.90272617	0.0044854	-0.0027889	1.0000000	0.461E+00 0.871E-02

277	129-0.5000001-0.5000001	3.84830856	0.0062366	-0.0015669	1.0000000	0.447E+00 0.782E-02
278	130-0.5000001-0.6000001	3.78745365	0.0050076	-0.0029344	1.0000000	0.452E+00 0.747E-02
279	131-0.5000001-0.7000002	3.72306919	0.0049517	-0.0027953	1.0000000	0.449E+00 0.696E-02
280	132-0.5000001-0.8000002	3.65608788	0.0040864	-0.0017462	1.0000000	0.443E+00 0.518E-02
281	134-0.6000001-0.1000000	3.92862511	-0.0004995	-0.0001280	1.0000000	0.441E+00 0.359E-03
282	135-0.6000001-0.2000000	3.90910625	0.0034603	-0.0058221	1.0000000	0.541E+00 0.213E-01
283	136-0.6000001-0.3000001	3.87759454	0.0028021	0.0014182	1.0000000	0.420E+00 -0.341E-04
284	137-0.6000001-0.4000001	3.83672237	0.0053756	-0.0032259	1.0000000	0.463E+00 0.103E-01
285	138-0.6000001-0.5000001	3.78746128	0.0025885	-0.0016244	1.0000000	0.447E+00 0.454E-02
286	139-0.6000001-0.6000001	3.73239708	0.0039631	-0.0039016	1.0000000	0.457E+00 0.788E-02
287	140-0.6000001-0.7000002	3.67386723	0.0056053	-0.0013611	1.0000000	0.442E+00 0.678E-02
288	142-0.7000002-0.1000000	3.84832096	0.0043796	-0.0071148	1.0000000	0.687E+00 0.564E-01
289	143-0.7000002-0.2000000	3.83107758	0.0035011	-0.0027625	1.0000000	0.483E+00 0.133E-01
290	144-0.7000002-0.3000001	3.80363655	0.0037598	-0.0027022	1.0000000	0.466E+00 0.191E-01
291	145-0.7000002-0.4000001	3.76727200	0.0034752	-0.0015071	1.0000000	0.448E+00 0.412E-02
292	146-0.7000002-0.5000001	3.72307587	0.0023584	-0.0022746	1.0000000	0.451E+00 0.555E-02
293	147-0.7000002-0.6000001	3.67386532	0.0056748	-0.0025954	1.0000000	0.449E+00 0.872E-02
294	148-0.7000002-0.7000002	3.61972523	0.0062596	-0.0005374	1.0000000	0.440E+00 0.720E-02
295	150-0.8000002-0.1000000	3.76727200	0.0029543	-0.0052318	1.0000000	0.608E+00 0.458E-01
296	151-0.8000002-0.2000000	3.75198936	0.0019566	-0.0042466	1.0000000	0.565E+00 0.191E-01
297	152-0.8000002-0.3000001	3.72776699	0.0017095	-0.0032434	1.0000000	0.479E+00 0.194E-01
298	153-0.8000002-0.4000001	3.69571018	0.0029348	-0.0025342	1.0000000	0.456E+00 0.892E-02
299	154-0.8000002-0.5000001	3.65608978	0.0016521	-0.0013728	1.0000000	0.445E+00 0.385E-02
300	155-0.8000002-0.6000001	3.61077976	0.0036529	-0.0034468	1.0000000	0.453E+00 0.826E-02

```
 301  157-0.9000002-0.1000000  3.66702984  0.0034696-0.0090484 1.0000000   0.723E+00
                                                                          0.872E-01
 302  158-0.9000002-0.2000000  3.67387199  0.0035476-0.0039124 1.0000000   0.496E+00
                                                                          0.213E-01
 303  159-0.9000002-0.3000001  3.65244675  0.0037126-0.0025461 1.0000000   0.462E+00
                                                                          0.114E-01
 304  160-0.9000002-0.4000001  3.62401962  0.0056739-0.0017174 1.0000000   0.449E+00
                                                                          0.955E-02

 END OF SKEW RAY TRACE.

   TOTAL NUMBER OF RAYS TRACED =  304
   TOTAL NUMBER OF MIRROR IMAGE RAYS =  144
   TOTAL NUMBER OF RAYS STRIKING IMAGE PLANE =  304
1 IMAGE PLANE SPOT DIAGRAM ANALYSIS:

 THICKNESS =0.0500000  U =0.0        ALFAP =0.0        R =1.0000000

 CENTROID: YCENTR =  0.0,  ZCENTR =  0.0027303

 STANDARD DEVIATIONS:  SIGMAY =  0.0000985  SIGMAZ =  0.0000194

 RMS SPOT SIZE: RMSRAD =  0.0052860

 SPOT DIAGRAM ENERGY DENSITY VS. RADIUS FROM CENTROID:
  IZ4     RADIUS    FRACTION

    1  0.0050000  0.6776316
    2  0.0100000  0.9605263
    3  0.0150000  0.9835526
    4  0.0200000  1.0000000
    5  0.0250000  1.0000000
    6  0.0300000  1.0000000
    7  0.0350000  1.0000000
    8  0.0400000  1.0000000
    9  0.0450000  1.0000000
   10  0.0500000  1.0000000
   11  0.0550000  1.0000000
   12  0.0600000  1.0000000
   13  0.0649999  1.0000000
   14  0.0699999  1.0000000
   15  0.0749999  1.0000000
   16  0.0799999  1.0000000
   17  0.0849999  1.0000000
   18  0.0899999  1.0000000
   19  0.0949999  1.0000000
   20  0.0999999  1.0000000
   21  0.1049999  1.0000000
   22  0.1099999  1.0000000
   23  0.1149999  1.0000000
   24  0.1199999  1.0000000
   25  0.1249999  1.0000000
   26  0.1299999  1.0000000
   27  0.1349999  1.0000000
   28  0.1399999  1.0000000
   29  0.1449999  1.0000000
   30  0.1499999  1.0000000
   31  0.1549999  1.0000000
   32  0.1599999  1.0000000
   33  0.1649999  1.0000000
   34  0.1699999  1.0000000
   35  0.1749999  1.0000000
   36  0.1799999  1.0000000
   37  0.1849999  1.0000000
```

```
 38   0.1899998E   1.0000000
 39   0.1949998E   1.0000000
 40   0.1999998E   1.0000000
 41   0.2049998E   1.0000000
 42   0.2099998E   1.0000000
 43   0.2149998E   1.0000000
 44   0.2199998E   1.0000000
 45   0.2249998E   1.0000000
 46   0.2299998E   1.0000000
 47   0.2349998E   1.0000000
 48   0.2399998E   1.0000000
 49   0.2449998E   1.0000000
 50   0.2499998E   1.0000000
 51   0.2549998E   1.0000000
 52   0.2599998E   1.0000000
 53   0.2649998E   1.0000000
 54   0.2699998E   1.0000000
 55   0.2749998E   1.0000000
 56   0.2799998E   1.0000000
 57   0.2849998E   1.0000000
 58   0.2899998E   1.0000000
 59   0.2949998E   1.0000000
 60   0.2999998E   1.0000000
 61   0.3049998E   1.0000000
 62   0.3099998E   1.0000000
 63   0.3149998E   1.0000000
 64   0.3199998E   1.0000000
 65   0.3249998E   1.0000000
 66   0.3299998E   1.0000000
 67   0.3349998E   1.0000000
 68   0.3399998E   1.0000000
 69   0.3449998E   1.0000000
 70   0.3499998E   1.0000000
 71   0.3549998E   1.0000000
 72   0.3599998E   1.0000000
 73   0.3649998E   1.0000000
 74   0.3699998E   1.0000000
 75   0.3749998E   1.0000000
 76   0.3799998E   1.0000000
 77   0.3849998E   1.0000000
 78   0.3899998E   1.0000000
 79   0.3949998E   1.0000000
 80   0.3999998E   1.0000000
 81   0.4049998E   1.0000000
 82   0.4099998E   1.0000000
 83   0.4149998E   1.0000000
 84   0.4199998E   1.0000000
 85   0.4249998E   1.0000000
 86   0.4299998E   1.0000000
 87   0.4349998E   1.0000000
 88   0.4399998E   1.0000000
 89   0.4449998E   1.0000000
 90   0.4499998E   1.0000000
 91   0.4549998E   1.0000000
 92   0.4599998E   1.0000000
 93   0.4649998E   1.0000000
 94   0.4699998E   1.0000000
 95   0.4749998E   1.0000000
 96   0.4799998E   1.0000000
 97   0.4849998E   1.0000000
 98   0.4899998E   1.0000000
 99   0.4949998E   1.0000000
100   0.4999998E   1.0000000
SPOT DIAGRAM CALCULATIONS COMPLETE.
TO OBTAIN PLOTS FROM THE PLOTTER OR THE PRINTER,
ISSUE THE FOLLOWING COMMAND:
        FOR PRINTER PLOTS          ENTER "LENSCOM PRINTER"
        FOR PLOTTER GRAPHS         ENTER "LENSCOM PLOTTER"
END OF PROGRAM
```

12. SUMMARY OF THE REPORT

Lens design and ray tracing to determine optical aberrations requires efficient computer codes. A clearly structured computer code with efficient algorithms has been developed to design a lens incorporating gradient refractive index, GRIN. One surface of the lens, either the inside or outside surface, is a circular cone.

The computer code includes lens design and calculation of optical aberration for a lens using a homogeneous material, i.e., for n equal to a constant. The homogeneous case is included for several reasons. The simpler case with n equal to a constant provides insight to the more complex case of variable n. Extensive computer codes require a check on the validity of the output. The homogeneous case provides a check. When the factor B is equal to zero in equation [2.9], the results for the two computer programs with and without GRIN should be identical. Needless to say, the results are identical for the programs reported here.

The case of a lens with GRIN and with a circular cone for the outside surface has been programmed. The companion case with the circular cone on the inside is being developed by Carr [15]. Carr's program can be readily incorporated into this computer code.

The program has been exercised for the case of 5% variation in refractive index for both negative and positive

values for B. The aim of the preliminary calculations was to verify operation of the computer program. More extensive calculations are required in order to understand the influence of various variables. As more experience is gained, the program should be combined with an optimization code to permit thorough and efficient lens design.

The selection of a 5% variation in refractive index was based on current state-of-the-art in the production of GRIN materials. A wider variation in refractive index may be needed.

The program is restricted currently to values of X_c satisfying the constraint $X_c \leq 0$. Additional work is needed to permit designs using positive values of X_c. When X_c is positive, the angle θ at some point along the ray interior to the lens has a critical value at which $dr/d\theta$ changes sign. The critical value causes computational difficulties.

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